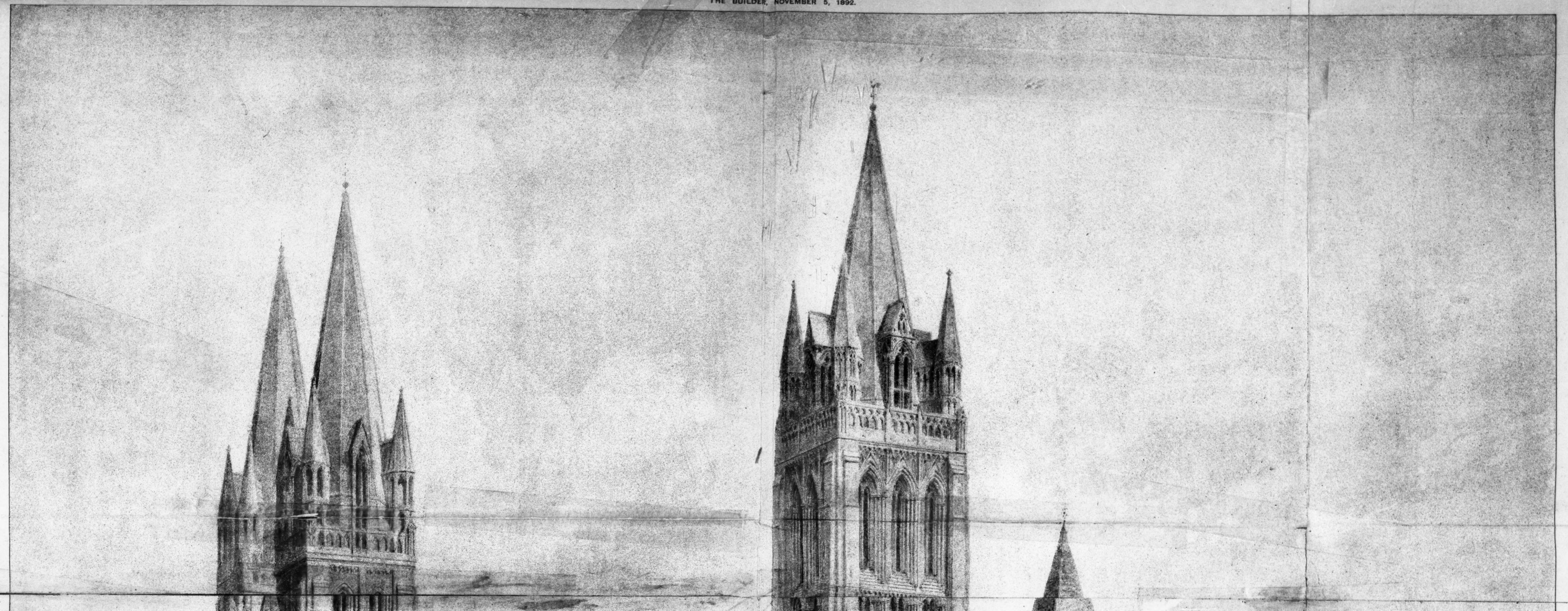
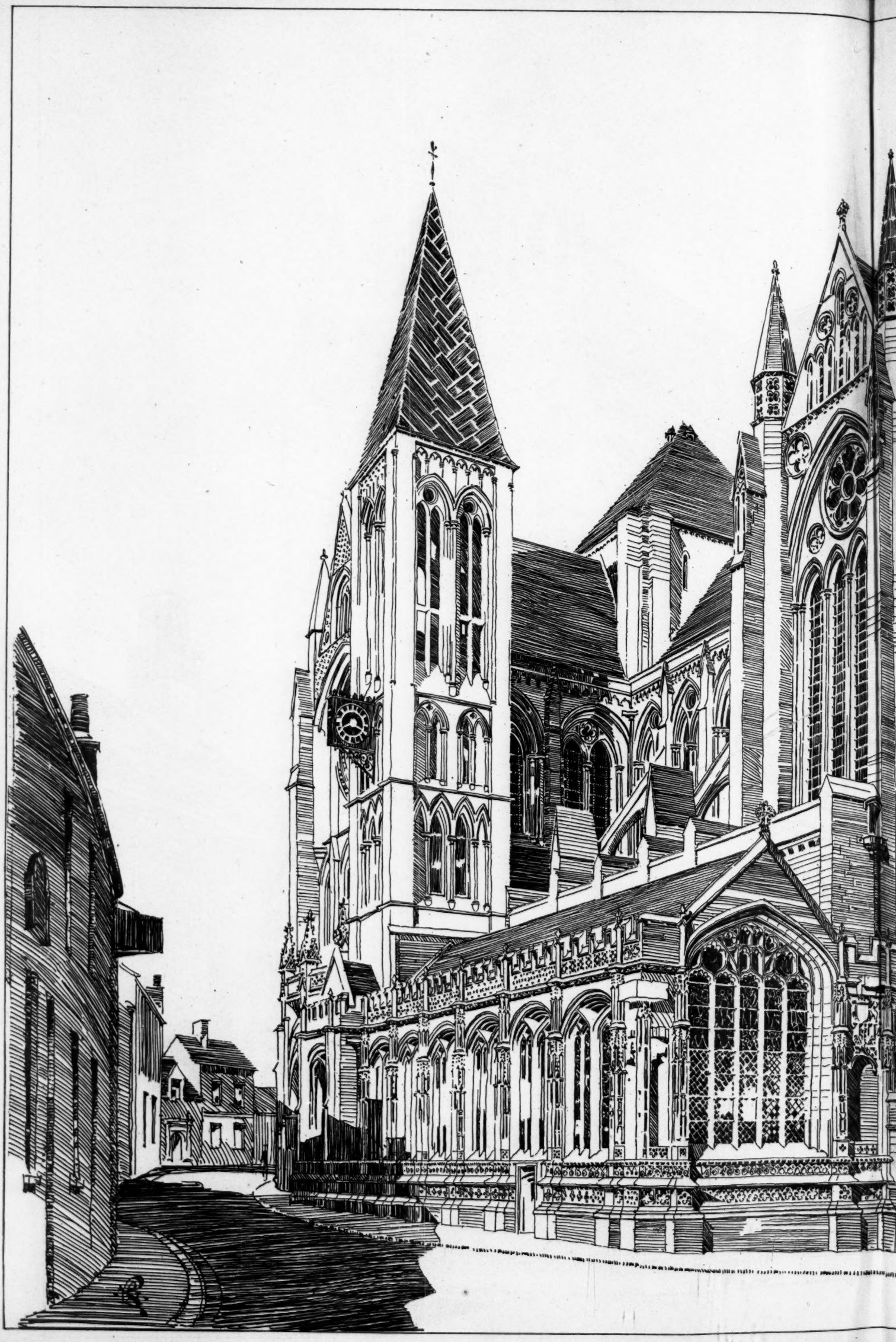
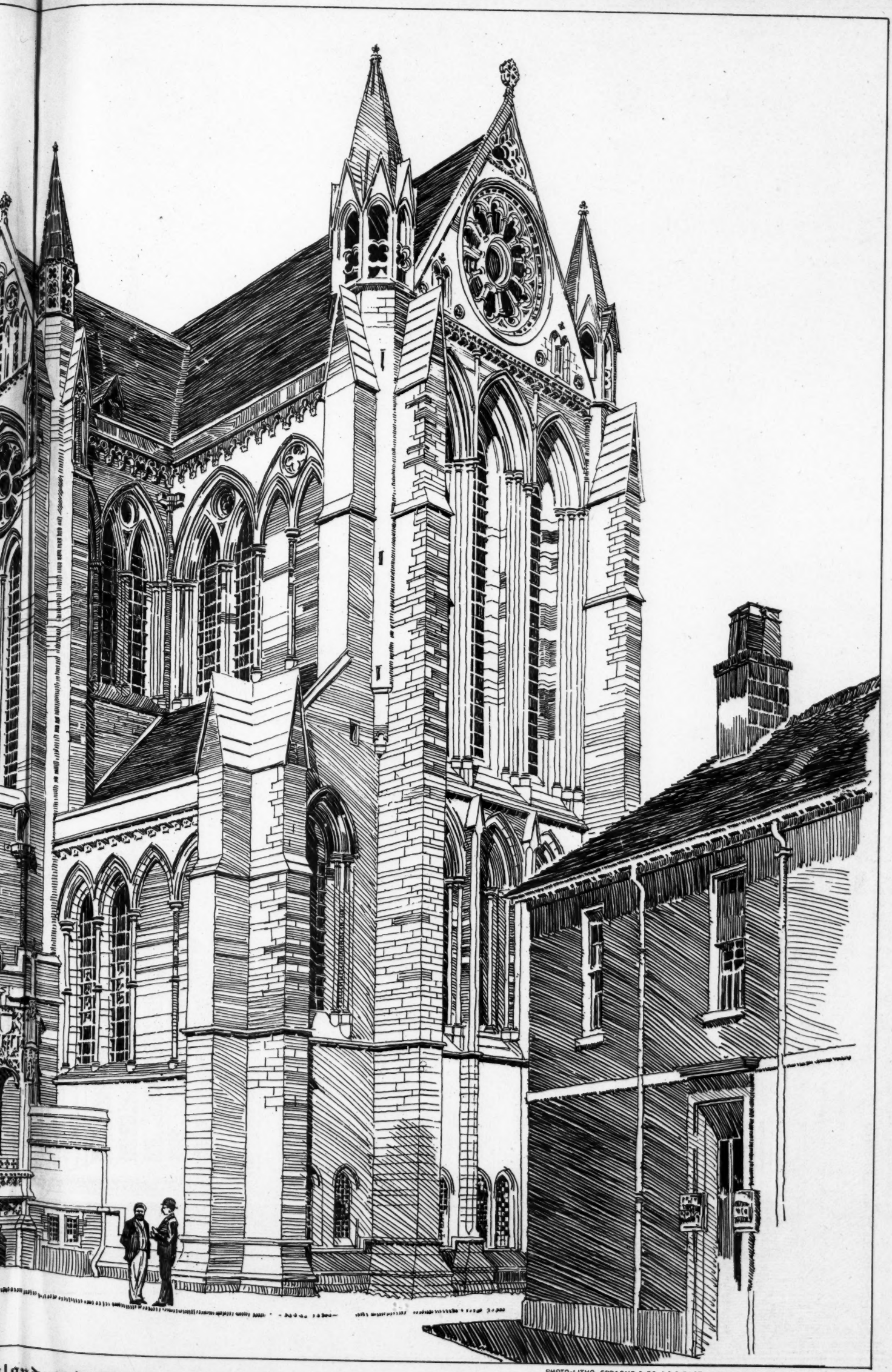




Cathedrals of England

No. 24. TRURO: FROM THE SOUTH-EAST.—DRA



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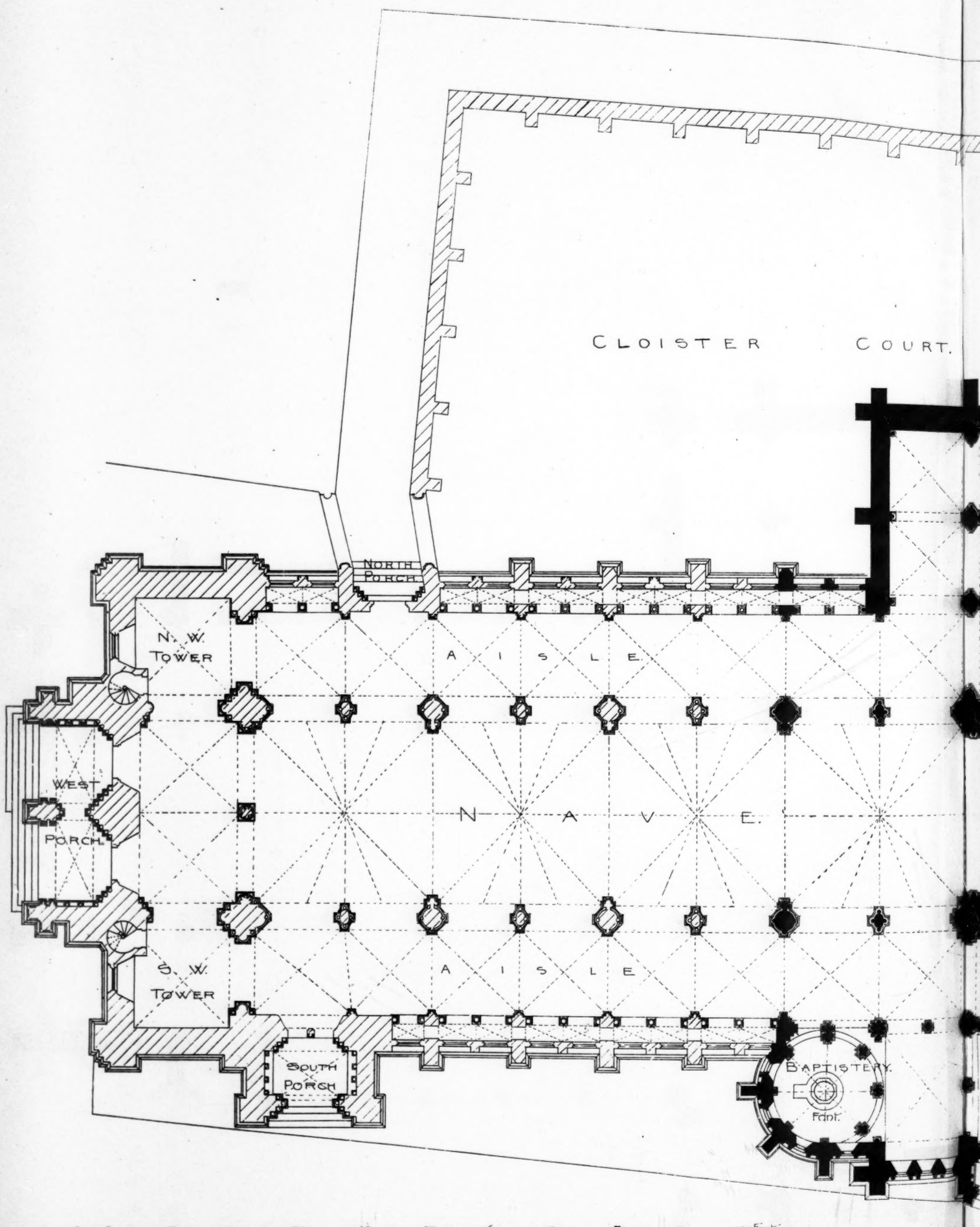
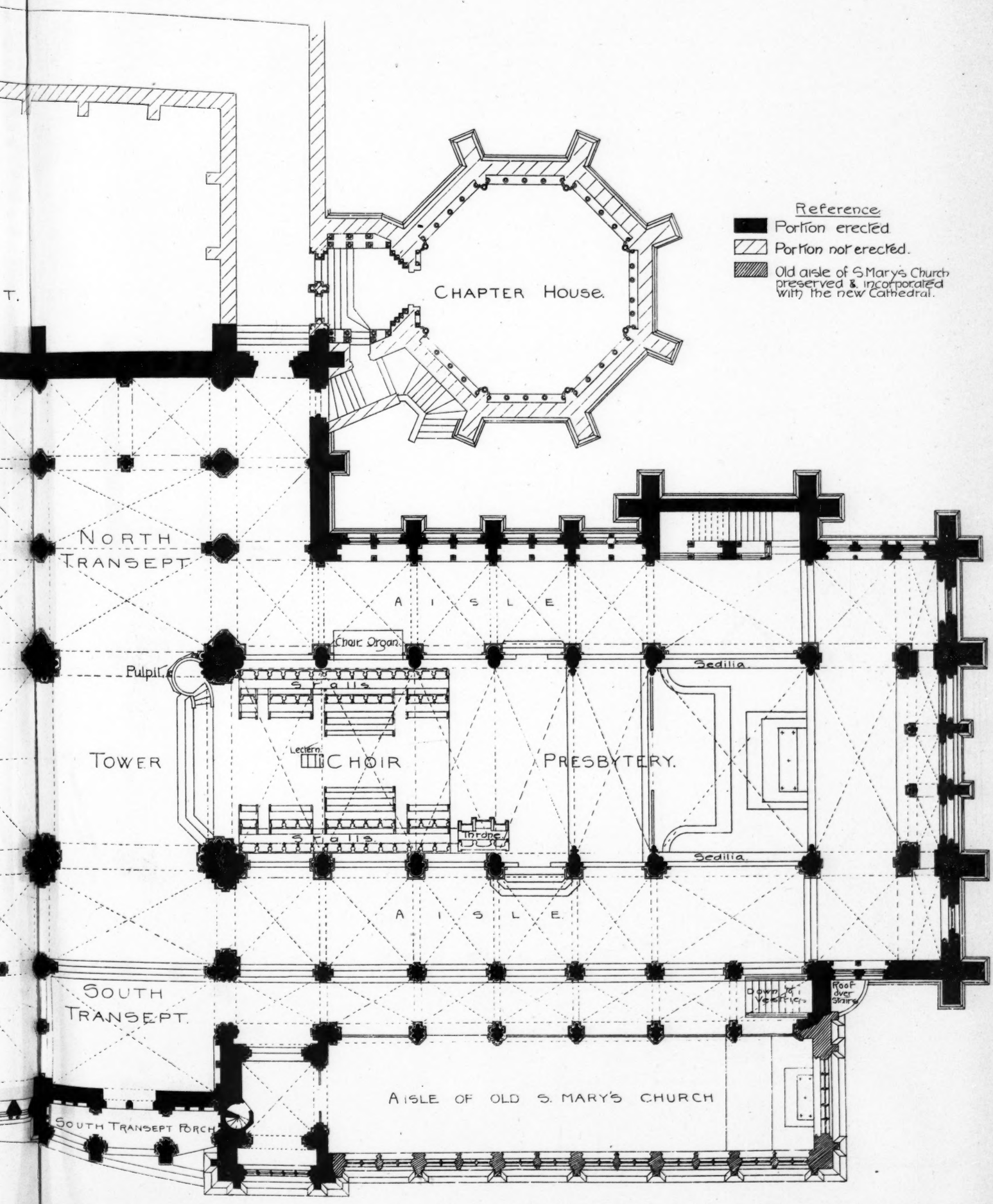
—Drawn by Mr. A. N. Prentice, A.R.I.B.A.

TRURO CATHEDRAL.

GROUND PLAN.





Mr John. L. Pearson R.A.
Architect.

PHOTO-LITHO. SPRAGUE & Co. 4 & 5 EAST HARDING STREET, FETTER LANE, E.C.

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DESIGN FOR EAST WINDOW, ST. MARGARET'S CHURCH, LOWESTOFT.—By Mr. Edward Frampton

Royal Academy Exhibition, 1892.

The Builder.

VOL. LXIII. No. 2597. NOVEMBER 12, 1892.

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New Premises, Heath-street, Hampstead.—Mr. Keith D. Young, F.R.I.B.A., Architect ..... *Double-Page Ink-Photo.*
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The Explosion of Range Boilers.

THE approach of winter brings to mind the fatalities and disasters that annually occur from the cause which forms the subject of this article. It is not that every cause of these serious accidents has any relation to cold weather; in fact, there is only one cause which has, but this one is the most prolific of trouble, for at least four-fifths of the explosions are directly traceable to frost.

The causes which lead to explosions are four:—1, Frost; 2, failure or shortness of water (sometimes due to frost); 3, stop-cocks; and 4, incrusted deposit. These four causes are placed in their order of virulence. There is a doubt whether the second and third should not be put upon terms of equality in regard to the degree of danger their existence creates; but, as regards the fourth, there is scarcely any danger at all traceable to it, notwithstanding the alarming advertisements to the contrary.

Taking these causes in the order of citation, one of the ways by which frost can cause an explosion is by solidifying, *i.e.* freezing, the water in the two circulating pipes that lead from the boiler, so that any steam generated cannot escape. The general safety of every apparatus is supposed to be provided for by an open pipe at the highest point. This pipe should allow free escape for steam, and is also intended to allow for the expansion of water as it is heated: it is, in fact, usually called the expansion pipe. This open pipe at the top is efficient in preventing danger as long as it is open or there is a clear way through the pipes from this point down to the boiler, as there always should be. If, however, any part of this pipe or the circulating pipes between it and the boiler be in exposed places where frost can act vigorously upon them, there is every probability that during the six or seven hours at night when the fire is out, the water may be cooled down sufficiently to freeze. If the frost can act in this manner and the water is frozen hard in three or four or more feet of pipe, the open pipe at the top is of no avail, as the passage between it and the boiler is cut off, and no other escape for steam, &c., exists.

In such a case as this we may, theoretically, look for an accident to occur; but fortunately there are several incidental chances that may ensure safety. When the steam escape-pipe is practically closed by ice in it, or in the circulating pipes below it, there is certainly no escape for steam if it is generated, nor is there room for expansion. Before, however, an accident of any kind can occur, we have to get the water at a high temperature, and this, with the time it occupies, is an element of safety. First, the gradual heating of the water may melt the ice in the pipes; and if it is warmed ever so little it will melt sufficiently to be loosened by the expansive force of the water as it gets heated. If it moves, then safety is assured, as it will quickly melt. Secondly, some one may go to a tap and at once discover that something is wrong; this is an element of safety, as everyone who knows the danger of frozen pipes would immediately extinguish the fire. Undoubtedly very many distasters have been avoided by these little incidental circumstances, and during the severe frosts of last winter there is no doubt some scores of kitchen fires were lighted when it was highly dangerous to do so. Sometimes only one of the circulating pipes gets bitten, and then there is no danger; but as it is usual for both pipes to be run side by side, they generally fare alike.

When the apparatus is upon what is known as the Tank System, with the hot-water reservoir or tank at the top of the house, a danger exists if the frost attacks the cold supply-pipe alone. If this pipe is frozen up, the hot-water apparatus is no longer furnished with cold water as fast as the hot is withdrawn. The first intimation of this is that water cannot be obtained from the hot-water taps, and this means that the apparatus has been emptied down to the tap in question. This is a serious matter, and the fire should be extinguished at once, until water runs freely at the taps, or, in other words, until the cold supply-pipe is clear again. If the fire is not extinguished there is a considerable likelihood of an explosion, for what little water is in the boiler and pipes will be quickly evaporated, and the boiler will get red-hot. The red-heat of the boiler is not dangerous in itself, but if from any cause the frost-bitten pipe should suddenly run free again, and water enter the boiler while the latter was red-hot, the result would be disastrous to everything near it. This particular way in which an accident can occur is the one which without doubt has caused three-fourths of the fatalities on record. When a boiler bursts owing to the steam outlet being closed, the explosion is not of nearly so serious a nature as that from water flowing into a red-hot boiler. With the latter it is the effect of steam in its enormous expansive and rending force that does such serious hurt. With the former it is a burst and not an explosion in the true sense of the word. With the general freezing of cold supply-pipes that occurred in the last severe frost, the wonder is that accidents did not reach alarming numbers, instead of being so few. Of course there is scarcely a person who would be so injudicious as to continue working a range when the taps plainly indicate that the apparatus is short of water.

The remedy for all this is, of course, to prevent frost attacking the pipes. If pipes are run in sheltered places, where the temperature does not fall below freezing-point to any serious extent, no freezing can occur to the water sufficient to be dangerous. It is, however, of very little good caring for seven-eighths of the pipe if one-eighth is left so that frost can attack it successfully. This is frequently the case, the pipes in many instances being snugly cased and packed down in the house, while several feet are left uncared for in the roof. The cold-supply pipe, which is of so much importance, and the steam-escape pipe (also an important detail) are generally in as cold positions as they can well be placed in. Unless there is a cistern-room, some part of both these pipes will probably be exposed in a cold roof, where the cisterns are.

If pipes cannot be placed in fairly warm situations they should be covered with some material to keep them warm, that is, to prevent their losing heat. Hair felt, which is inexpensive, is a really good material, as it most nearly approaches what nature has provided to conserve the heat in living things. Some say that the warmth of a hot-water

pipe within this material is conducive to the production of insect life. This may have occurred in some instances, but it is not usual. A material which cannot have this effect, but which is well adapted for preventing loss of heat, is silicate cotton. The only disadvantage of this material is that it is not made in sheets or strips for winding on pipes; it is necessary to encase it. Almost any material of a woolly or grassy or woody nature will answer fairly well. Sawdust, carpet, cloth, hay-bands, and such like, will all aid in keeping out frost, but hair-felt or felt-carpeting should be used if possible; not in one thickness only, but in two or three thicknesses,—say, ¾ in. thick. If a pipe is put in a casing, it is worse off than before if the casing is not packed tight with some materials such as those named. Pipes in a case without any packing-material are worse off than exposed pipes, owing to the current of air that sets up within it, particularly if the casing be vertical or sloping. This applies to both cold and hot water pipes, but more especially to the latter. When hot-water pipes are carried up outside a house, as they are sometimes (not a commendable practice if there is a possible way of avoiding it), the encasing and packing becomes of considerable importance, as it must be done thoroughly. The casing should be large enough to admit of at least 1¼-in. of packing-material surrounding the pipes. Properly speaking, there should be some packing between the pipes and the wall, for if by any chance the casing warps, or comes away from the wall, ths fissures so caused will lead directly to the pipes, and do all the harm possible.

So far we have spoken of the effect of frost in attacking the hot-water pipes, and in causing shortness of water by freezing the cold-water service. The particulars given in this latter case apply in just the same way when the failure of water proceeds from any other cause. In towns and places supplied by a water company the water supply is as regular as could be wished; but in outlying districts it is not so, and hundreds of country residences rely upon a gardener's attention to a pump, which commonly makes the supply very irregular indeed. In such houses it is no uncommon thing for the cistern to be emptied, not perhaps in the regular way, but when, on exceptional occasions, there is a greater than usual quantity of water used. With that system of hot-water works in which the tank or reservoir is at the highest point, there is every possibility of danger occurring, as the apparatus requires to be emptied before any shortness of water is indicated. With the pipes erected on what is known as the cylinder system, all the draw-off services are taken from above the reservoir, and this latter cannot be emptied. The result of this is that shortness of cold water supply is an inconvenience only, for by this plan there remain some 40 or 50 gallons of water in the apparatus after the taps cease to yield any, and the cylinder system should therefore always be adopted in residences that have an uncertain supply of water.

The next cause of explosions,—stop-cocks in main circulations,—is only less prolific of trouble than the last, due to stop-cocks not being in common use for this purpose. If it was the regular thing to put stop-cocks in the main circulating pipes, the number of accidents would be very large. It is a dangerous practice, and condemned by every practical man. What leads to people having stop-cocks so placed is the idea of saving labour and nuisance when the boiler has to be opened for cleaning purposes or repair. By means of stop-cocks so fixed, all communication can be cut off between boiler and tank when desired, and it would be possible to remove the old boiler, and replace it with a new one, without emptying the tank. It, however, must be repeated that the introduction of stop-cocks in these pipes is very dangerous, and should be avoided. One of the last recorded fatalities from boiler explosion was due to these. The plumber who closed them when he opened the boiler to clear it of deposit, omitted to open them when he had finished his work and lighted the fire again. *He was killed.* This was the result of stop-cocks in the hands of a "practical man." It is therefore easy to imagine what may happen if they are meddled with by inexperienced persons. When stop-cocks are not used it becomes necessary to empty the whole apparatus when the boiler is opened, but this is very little trouble, after all. An emptying service should be provided, but the tap should have a loose key, and only be used for actual emptying purposes. It may be added that there is no danger in putting a stop-cock in one pipe only, as one clear pipe will suffice to prevent a disaster.

The next and last cause of boiler explosions, pipes choked with incrusted lime deposit, is a possible cause, certainly, although it is doubtful if such a result has ever really taken place. In the first place, it is unusual for both circulating pipes to become furred seriously. The furring of the flow-pipe is very frequent, and occasionally (rarely) a section of this pipe is found quite solid with deposit. The return-pipe does not fur up so quickly, and the element of safety is the fact that when the flow-pipe becomes partially choked the apparatus gives out alarming noises and vibrations. The result is that weeks, and sometimes months, before there is any real danger the noises have necessitated something being done, as they simply frighten people. It has to be admitted that if the furring did not bring about these significant noises it would be the commonest cause of danger possible, and we should almost daily hear of accidents from this cause. The warnings, however, do occur, and before the pipes are choked to an actually dangerous extent they become quite unbearable. In this fact lies safety, for the collection of deposit is very gradual, and it never occurs suddenly.

The remedy for all these dangers is a safety-valve, but there should be some care exercised in this. A safety-valve cannot usually be put direct into the range boiler, and has, consequently, to be connected thereto by a pipe. It is better to have a distinct pipe for this rather than use one of the circulating pipes, as a pipe which has the water almost stationary within it is less liable to fur than one of the circulating pipes. This should also be of good size, so as to ensure its keeping clear and not being choked with deposit; and the shorter it is the better.

Safety-valves are of several kinds, but those most commonly used for this work are two, viz., the spring and the dead-weight. There are about as many used of one as the other, some people favouring the latter to the prejudice of the former; but on the only two occasions coming under the writer's experience, in which safety-valves were the means of preventing disasters, they were both of the spring variety. With the spring-valve the seating is a flat surface, and it is said that in course of time one flat surface against another (vulcanite or composition against metal) will become firmly fixed, and would not come apart or open when relief was required. Certainly, in course of time these surfaces do stick together, but it is doubtful if they would ever become so securely attached as this. With the dead-weight valve the seating is a knife-edge of metal against a flat metal surface, and there is undoubtedly less likelihood of union between two surfaces such as these. This latter valve is larger than the other, but this is no particular fault in a general way.

Considering the comparatively small expense, it should be a more prevalent practice to put safety-valves to range boilers than it is. It is quite a simple matter when the range is being fixed (although not so easy afterwards), and safety is thus purchased at little cost. Certainly dangers from the causes named are rather rare, or perhaps it is better to say accidents are rather rare; but when they do occur they are of such a terrible kind that really no boiler should go without this means of safety in emergency.

There is a kind of safety appliance known as a "fusible plug." This, although correct in principle, has met with little favour, and it must be admitted that it is not suitable for use in boilers that have to heat hard water. With these waters, which cause an incrusted deposit, the plug would probably get furred over, and this would vitiate its action.

NOTES.

THE President of the Institute of Architects may be congratulated not only on a very able and comprehensive discourse, but on having made what is certainly one of the best points ever made in a presidential address, in his criticism on the illogical and costly method in which the serial publications of the Institute are carried on. It is a common and a rational method for societies of that kind to print reports of separate meetings which can be bound up and form a complete record at the close of the session. The Institute method has been to publish one form of report immediately after each meeting, and another form of report at the end of the session, thus producing its records double, to a great extent, and increasing both the cost of production and the "making of many books." If the *Journal of Proceedings* contained only a brief summary of the meeting, just to keep members informed of what was going on until the publication of the sessional volume, there would have been more reason in it; but the President pointed out that while in the *Journal* the papers are summarised and the discussions given in full, in the *Transactions* the papers are given in full and the discussions summarised, so that neither publication gives a full report of any meeting. To only draw attention to such an anomaly seems sufficient to cause its repression, and as the reduction of this double but not duplicate publication to one series would mean a saving of 500*l.*, we hope that in that case there will be some funds to devote to that portion of the Library which is at present most inadequately provided, viz., foreign magazines and publications connected with art and architecture. Attempts have been made for twenty years back, for instance, to get the *Gazette des Beaux-Arts* into the Library, a publication which is a perfect mine of valuable information and fine illustration in regard to decorative art and architecture, and which goes on improving with years; but all to no purpose; and the absence of the leading German archæological publications is equally a defect which ought to be remedied.

IT is satisfactory to learn that the arrangements connected with the formation of the Chamber of Arbitration to be established under the auspices of the London Chamber of Commerce and the City Corporation are now nearly completed, and the scheme is about to become an accomplished fact. The details which have been published show that considerable care has been taken to ensure the efficiency of the tribunal, and to render its decisions as authoritative as possible. The procedure will be very similar to that of a court of law, the legal assessor and other principal officers being barristers or solicitors familiar with London commercial practice. The list of arbitrators will necessarily be very large, having regard to the varied nature of the questions with which the Chamber may be called upon to deal; but all will be first approved by the Court of Common Council. So many of the lamentable disputes of recent years might obviously have been avoided by a court of this nature that its future utility cannot be doubted. There will be an elasticity about it which will permit of disputants availing themselves of it in cases which could hardly have been submitted to a tribunal in which the methods of procedure and the choice of arbitrators had been more limited. For instance, a case may be mutually prepared by the parties interested, and laid before a single arbitrator, or two arbitrators and an umpire will be

provided, before whom the parties may call witnesses, and proceed in accordance with the general law of arbitration. The formal inauguration of this Chamber, which has been fixed for the 23rd inst., may mark an important epoch in the commercial life of the Metropolis. The President of the Board of Trade, who will take part, speaking at the Sheffield Cutlers' Feast last week, declared that internal industrial peace was at this moment of vital importance to the prosperity of this country. He said that anything he could do in the department over which he presided to facilitate the settlement of disputes of this nature, or to prevent them, if possible, should be considered by him a matter of bounden duty. Mr. Mundella was probably referring more especially to disputes between capital and labour; but the inauguration of this tribunal may be looked upon as a step in the direction indicated, as our trade and commerce have neither time nor money to spare in needless disputes, of whatever nature.

ON Friday, the 4th instant, Dr. Tristram, Q.C., sitting in the Consistory Court, St. Paul's, granted a faculty for the entire removal, at a computed cost of 2,000*l.*, of the human remains from beneath the Church of St. Mary Woolnoth, Lombard-street. It was stated in Court that the parishioners had subscribed 700*l.*, and the Charity Commissioners had spent 1,200*l.* in cementing the vaults, but to no purpose, the nuisance continuing, so that the church had to be closed ten months ago. We have already commented upon the insanitary and, in that respect, highly dangerous condition of the church, which it was foolishly contemplated to remedy by pulling the building down. The removal of the remains can, at this distance of time, hurt the susceptibilities of no one; and we are surprised that so obvious a measure was not sooner applied.

AN important question connected with the Railway and Canal Traffic Act of 1888 is the publication of intended increases in rates. The Act alluded to conferred a great benefit upon the trading public in laying down definite regulations for the due notification of all such advances, the clause requiring the companies to give "by publication in such manner as the Board of Trade may prescribe at least fourteen days' notice of such intended increase, stating in such notice the date on which the altered rate or charge is to take effect." As a further guarantee it is enacted that "no such increase in the published tolls, rates, or charges shall have effect unless and until the fourteen days' notice required under this section has been given." Now, we have it on the authority of Sir George Findlay that on January 1 next "millions of old rates will be cancelled and new ones issued,"—that is to say that, in order to ensure all the charges being within the new Parliamentary limit, the existing rate-books are to be entirely swept away, and replaced by fresh ones based upon the authorised schedules. Therefore, even if a large proportion of the old rates are reinstated or reduced, the number of alterations necessitating public notice might still run into hundreds of thousands. It is somewhat reassuring to find Sir George Findlay stating last week, at a conference at the Board of Trade offices, that there would be but little alteration, as they had been endeavouring to frame the rates in such a manner as to avoid materially advancing them. Still, it is essentially necessary that manufacturers and others should be advised of all advances affecting them, and the question is being carefully considered by the Board of Trade with a view of devising a plan for making the required information public. The subject is also occupying the attention of Sir James Whitehead's organisation,—the Mansion House Association on Railway Rates.

AMONGST other bequests by the late Mr. Thomas Nelson, publisher, Edinburgh, is one of 50,000*l.*, to be expended in the erection and maintenance of "rests" for labouring men, where they can spend their leisure hours in reading, smoking, and conversation. According to his directions, the buildings are to be erected in Canongate, High-street, Grassmarket, and Cowgate, and are to be of one story in height, similar to the folding-room in the publishing works at Parkside; and they are to be plain, unadorned structures. The restriction of the buildings to one story makes their erection directly on the lines of thoroughfare named prohibitive, and they must, therefore, be relegated to closes or back courts,—an alternative much less desirable than if they were brought to the front with two or three stories above. Ample light and ventilation can be provided in such circumstances, and it is fortunate that some discretion is left to the trustees in carrying out the testator's will.

THE purchase having been completed (see our "Note" of July 16 last), West Wickham Common will be formally opened to the public to-day by the Lord Mayor. In compliance with a memorial of the inhabitants, the Board of Agriculture, acting under the Metropolitan Commons Acts, 1866-78, have framed a scheme in respect of Darrick, Broomhall, Gumping, and Sparrow commons at Orpington, in Kent, providing for the laying out of the land for public resort and enjoyment. This parish, together with West Wickham, was once owned by Odo, Bishop of Bayeux, who, however, in the conclave held at Pinenden, 1076, was forced to surrender the property he had wrested from the monks of Canterbury. Sir Percival Hart entertained Queen Elizabeth at Orpington on July 22, 1573. From the Harts it passed by marriage to the Dyke family. To pass to another and a now purely urban locality, we may mention that, under the Open Spaces Acts, the burial-ground attached to the Holloway-road Chapel-of-ease will be taken over from the vicar by the Islington Vestry, for maintenance as an open space accessible to the public, subject to licence by the Bishop of London. In regard to the forty acres at Brockley, known as "Hilly Fields," to which we adverted in the "Note" already cited, we read that it is proposed to purchase the interests of Mr. Lee's trustees and the New Land Development Company, for 36,350*l.*, thus leaving a balance of 3,357*l.* for the further liability of purchasing four acres of land from the Ecclesiastical Commissioners for 4,000*l.* It is also stated that the purchase-moneys (13,000*l.*) for Bostall Woods, Plumstead (fourteen acres in extent), is now forthcoming, the London County Council having contributed one-half. The land belongs, we gather, to Sir Julian Goldsmid. The Metropolitan Public Gardens Association have opened to the public Spitalfields Churchyard, and the Great Church-lane Recreation Ground, W.; they have begun to lay out similar spaces at Duncan-terrace, Islington; Marigold-street (a gift); Victoria Park Cemetery; and Goldsmith-square.

THE London County Council have undertaken to restore, under the direction of Mr. Blashill, Lauderdale House, which, together with its own terraced and old-fashioned garden, is now included in Waterlow Park, Highgate. The Park, as our readers will recollect, consists of 29 acres, the gift of Sir Sydney Waterlow, to which he added 6,000*l.* for the purchase of the freehold of a portion,—2¾ acres,—then held on lease. The Council voted 4,900*l.* to defray the cost of adapting the grounds for public resort. The house was the home of John, Duke of Lauderdale, and, it is said, of Nell Gwynne. Next northwards stood a cottage once occupied by Andrew Marvell. Views of the two premises as they appeared about fifty years ago are contained in the Archer and Twopeny collections at the British Museum. Nearly opposite Marvell's cottage, on the roadside bank, stood Arundel House, since rebuilt, where Bacon, attended by Sir Julius Cæsar, closed his life, and whence, on June 3, 1611, Lady Arabella Stuart escaped in what proved to be an unsuccessful effort to rejoin her husband.

THE new harbour at Hamburg has been the scene of a fourth disastrous fire since its opening, and, as before, the confidence placed in the elaborate "fireproof" construction employed in its warehouses has been misplaced. This time the structural defects have not only caused an enormous loss of property, but also a long list of casualties, including the death of the chief officer of the fire brigade in attendance. In the construction of the Hamburg warehouses much importance was attached to the horizontal division of the different risks with the aid of girders, bricks, and concrete, whilst in the new Bremen Free Port this division is solely by means of timber-work. Whilst in the one case the intense heat of fires originating on one of the floors caused even well-protected ironwork to expand and collapse, whereby whole blocks were gutted, the timber-work has withstood similar strains exceedingly well, and in no case has the conflagration extended from one risk to another. The greater efficiency of the Bremen fire brigade must, of course, be taken into account, but only to a certain extent, as the warehouses they have to deal with are considered to be more dangerous than those at Hamburg.

AMONGST the collection of shooting-galleries, billiards, skittles, confectioners' stalls, type-writing machines, &c., now on view at the Agricultural Hall, and dignified by the name of "The Engineering Exhibition," we notice but very few good exhibits of an engineering nature, and nothing very novel. There are a number of gas-engines, unfinished stalls, and unoccupied chalked-out floor spaces, and here and there well-known engineering firms are represented by the stock exhibition attendant,—in charge of three or four exhibits,—and who knows nothing about either of them; but the engineering element is absent from the exhibition as a whole. A recently-introduced series of Swiss marbles is certainly a redeeming feature, and occupies a prominent position, but it is difficult to understand their connexion with engineering. The fact is that, as we have said on former occasions, periodical exhibitions of this kind are well-nigh played out. As a rule they are run on purely business lines, and the enterprising promoter is not very particular who exhibits at them, provided he can induce the exhibitor to take a space at a remunerative figure. We do not know whether the exhibition now referred to was got up on this principle or not—whether it is merely a private speculation or a *bonâ fide* attempt on the part of people interested in engineering to get together something really representative of the industry; but a more miserable failure of an "engineering" exhibition it would be difficult to conceive.

OUR attention has been drawn by Professor Aitchison to the fact that the *Architectural Record* (New York) is coolly reprinting in full his Royal Academy lectures on Byzantine architecture from our columns. There is of course not a word of recognition of the *Builder*. We may point out that these lectures were not published in the English press generally: they were given by Professor Aitchison for publication in this journal only, in which (with a few exceptions) the architectural lectures by Professors at the Royal Academy have for many years back been published in full, and were not intended for publication generally. As far as we are concerned the American journal in question might have been at full liberty to republish them on the simple condition of stating to what source they were indebted; but without Professor Aitchison's permission no one had any right to further invade his literary property. It seems hopeless to look for common honesty in these matters from most American journals; but if we have the pleasure of printing any further Royal

Academy lectures by Professor Aitchison, we must see if means cannot be taken to safeguard them against the assimilating propensities of American editors. If not, we fear it may be necessary for the Professor, in his own interests, to decide against their publication until the time comes for their more permanent publication in a book form which we hope we are to look for.

MAGAZINES AND REVIEWS.

THE *Gazette des Beaux-Arts* starts with an article on the Renaissance sculptures at the Château de la Bastie d'Urfé, representing, it is suggested, a special school of local sculpture. It is illustrated by engravings of some fine works and sculpture. An article by M. T. de Wyzewa on the exhibition of "Les Arts de la Femme" at Paris follows. "Burne Jones, Décorateur et Ornamentiste," is the subject of an enthusiastic but just and well-balanced article by M. Paul Leprieur, illustrated by a fine engraving of "The Wine of Circe," which he praises especially for the composition (in a decorative sense) and the fine choice which the painter has made of the right *moment* of illustration, that of the mixing of the fateful draught while the approaching vessels of Ulysses and his company are seen through the open window. In concluding, the author remarks that it is by long and severe study that Mr. Burne Jones has attained his great decorative quality of design, a lesson to those who "dans leurs cercles fermés et leurs petites coteries, n'ont le plus souvent que des prétentions creuses et un art avorté." "Le portrait miniature en France" is continued by M. Henri Bouchet, with three charming chromolithographs of children by Fragonard. The museums and art publications of Holland are the subject of an article by M. Émile Michel.

The *Art Journal* contains an article on "Recent Fashions on French Art," by Marion Hepworth Dixon, dealing in the first instance with the remarkable feeling and method of M. Henri Martin, to which the writer does what may be called rather grudging justice. The Birmingham Art Gallery is the subject of a well-illustrated article by Mr. Cundall. An article on "Mr. Logsdail and Lincoln" is illustrated by a reproduction of his clever picture of "Lord Mayor's Day." Birmingham is again noticed in Mr. Aymer Vallance's article on a provincial school of art, with illustrations of some very good decorative designs by its students; and Mr. Claude Phillips contributes an article on Raphael's "Crucifixion."

The *Art Annual*, the annual number of the *Art Journal*, is devoted to the works of Mr. Herkomer, prefaced by an admirable engraving of "The Last Muster," and another of the noble portrait here entitled "Entranced," though we think that was not the title under which it was first exhibited. There are numerous other illustrations.

The *Century* includes an article on "A Russian National Artist," Répin, by Miss Isabel F. Hapgood, with illustrations from some of his works.

Scribner opens with the seventh article on "Great Streets of the World," in which Mr. Henry James deals in a worthy manner with that ever-fascinating subject "The Grand Canal." Mr. Brownell's third article on French painting deals with the modern realistic school, and he defends Monet for his system of painting the shadowed portions of a landscape with full detail, leaving nothing to form an adequate contrast with the lighted portions. We can only say that we entirely dissent from both painter and critic. We have no sunlight to paint with, and to fill in all the detail in shadow is simply depriving us of the sunlight, and making a picture which is true in one half of its detail at the cost of being false as a whole, and that is the general impression the landscapes of the *plein air* school give us. They are nature with the sunshine taken out.

Harper's gives an article on "The Holy Places of Islam," by Mr. E. Dudley Warner, with some adequate illustrations; Mr. Theodore Child describes the Parisian boulevards, with illustrations by A. Lepère and P. Renouard; and an article on "The Designers of the Fair" deals not, as the title would lead one to expect, with painters of "types of beauty," but with the architects of the Chicago Exhibition buildings, whose portraits are given, accompanied by a good deal of talk about the manner in which the artistic and architectural work has been carried out, which seems to have been good and sensible in itself, but which is described and dwelt upon as if architects and decorators had never worked together on an exhibition building before; in fact, as if Chicago had invented art.

The *Fortnightly* contains a cosmical article by Mr. A. R. Wallace on "Our Molten Globe," giving some details as to the history and present condition of the globe on which the human race has formed what seems now to be regarded as but a temporary development. The late Duke of Marlborough contributes a rambling but pleasant article on "A Future School of English Art," including a rhapsody on Mr. Burne Jones, whom he describes as "the Wagner of painting,"—

> ——— "Powers
> Eternal! such names mingled!"

We should have thought no two names in art could be cited which awakened such opposite associations, and they are neither of them as great as the Duke imagined. But we sympathise completely with his amusing comparison between the Renaissance painters and the Cook's tourists who look at their great energetic works, so full of life; and also with the following remarks in regard to the proposed Gallery of English Art:—

"Now there is a popular fallacy that pictures are the only form of modern art which should be represented in a national collection. This is distinctly wrong. Every form of handicraft representing dexterity of the hand in elaborating the conception of the brain, has a right to enter the lists. Architecture is a most noble art, and depends on a power of design, a sense of proportion, and a general feeling of love for the magnificent and the beautiful in structure. Embroidery, lace, porcelain, goldwork, and notably bronze, as applied to figures and statuary, engraving of all sorts, and hundreds of other handicrafts which I could mention, have a right to artistic competition. The age is one of machinery, and machinery, though one of the greatest blessings of our time, presupposes the very converse of art. Hence the educational value of a national art collection is that it has no relation whatever to mechanical processes. Individuality of execution should be displayed in every object of art constructed. A modern South Kensington of the work of the best artists of the age would be the most useful national museum for the people. I fear if we were to endeavour to construct such a museum to-day it would puzzle the Mr. Tates to find the objects with which to fill it. Now I will take one specimen of what I mean. Look at that municipal gold chain which was made for Preston (I think) by Mr. Gilbert last year, and his small statue in silver of Victory the year before. Here are two works of contemporaneous art of considerable merit. Could we, in the field of bookbinding, say, or wood and ivory carving, find anything to put alongside of these so as to make a beginning?"

The *Fortnightly* also contains an article on the "Woman's Art Exhibition at Paris," by "A Frenchwoman," who sums it up as incomplete and one-sided, and thinks it rests with England to take up and carry out such an exhibition in a more complete manner.

The *English Illustrated* gives an interesting article on "The Green-room of the Comédie Française" by Mr. Frederick Hawkins, with illustrations from some of the portraits of past celebrities, and one on the "Cries of London," in which a number of old engravings of our ancient street tradesmen are reproduced.

In the *Nineteenth Century* Mr. Huish gives an article on the question "Whence comes the great Multitude of Painters?" Mr. Chamberlain contributes a long one on the labour question, to which we may give more detailed attention than we can in these passing notes.

The *Magazine of Art* is a very interesting number, and includes a short article by Mr. Tadema on "Art in its Relation to Industry," the keynote of which is that art and industry are inseparable. We should not be disposed to accept entirely Mr. Tadema's remarks on the origin of some of the features of Greek architecture, but he quotes a very interesting remark made to him by Sir William Siemens, to the effect that the delicately diminishing form of the Greek column was the exact form for carrying power arrived at by most modern engineering calculations; and Mr. Tadema remarks on this that "the constantly progressing feeling for proportion, through many generations of first-class architects, ought to lead at last to a sense of safety and strength which is equal to calculations;" a suggestion which will bear a great deal of thinking over. Mr. Walter Armstrong contributes an article on "Drawings in the British Museum," accompanied by many illustrations of varied interest. The "Leicester Corporation Art Gallery" is treated of by M. Viccars, with illustrations from some of its pictures; Mr. Harry Furniss writes on "Originality in Pen-drawing and Design," and M. Connon writes a short letter, "A Word to Young English Painters," exhorting all who come to study in France (which he rather encourages them to do) to use their study for the purpose of developing their English art, not in becoming French artists. M. Connon should write similarly to young American artists: they need it more.

From the introduction to the first number of the Philadelphia *Journal of Architecture*, to be published eight times a year (why eight?), we understand that its object is educational, "to encourage and advance the study of architecture pure and simple." It is a small and delicately got-up publication containing some good illustrations of Greek architecture, and two or three short but thoughtful essays, and appears altogether to be a very good little publication.

The *Antiquary* contains a review of Mr. Percy Stone's "Architectural Antiquities in the Isle of Wight," and (among others) papers on "Coped Stones in Cornwall" by Mr. A. G. Langdon (who has published something on the subject in our columns), "British and Roman Roads in the East Riding of Yorkshire" by the Rev. E. M. Cole, and "Holy Wells," by Mr. R. C. Hope.

To the *National Review* Mr. B. H. Thwaite contributes an article on "London Fog; a Scheme to Abolish it:" no new scheme, merely the recommendation of gas fires in place of coal, which has been often advocated. We are entirely in favour of gas fires for cooking, which would do away with a good deal of smoke. In regard to the others, it means giving up the most cheering indoor object in winter. The article contains some useful statistics.

Blackwood includes an article on "London After the Great Fire," in which Wren's ideas for rebuilding are characterised as "vast but impracticable," of which we feel by no means sure. In the course of it is some information as to the "first jerry-builder," one Barebone, who is said to have flourished in the rebuilding of the City, and some of whose houses fell down.

The *Revue des Deux Mondes* contains a long article on the Paris sewage question, summing up in favour of the Achères scheme and taking the sewage on to the land: "c'est beaucoup d'argent, dira peut être quelqu'un. Préferez-vous la fièvre?" concludes M. Fleury, whose name is appended to the article.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS:

THE PRESIDENT'S ADDRESS.

THE opening meeting of this Institute for session 1892-3 was held on Monday evening last at No. 9, Conduit-street, the President, Mr. J. Macvicar Anderson, in the chair.

Nomination of New Members.

The secretary, Mr. W. H. White, read a list of nominations for election to membership in the Institute, thirteen gentlemen being nominated as Fellows and eleven (all of whom had passed the Examination in Architecture) as Associates. Professor Charles Babcock, of Cornell University, Ithaca, U.S.A., was nominated as an Honorary Corresponding Member.

Statutory Examinations.

The President announced that at a statutory examination held on the 27th and 28th ult. five candidates presented themselves for examination as to their competency to fill the office of District Surveyor under the Metropolitan Building Act; of these, only one passed, viz., Mr. Watson Hall. One candidate also presented himself for examination as to his fitness to hold the appointment of Building Surveyor under local acts, but he did not pass.

The President's Address.

The President then delivered the opening address of the session, which was as follows:—

Gentlemen and Colleagues,—When the ancient Emir declared "Oh that mine adversary had written a book," he quaintly, though perhaps unconsciously, betrayed the relish with which he would ruthlessly expose the weak points displayed in the recorded opinions of his enemy. In the belief that I have no

adversary within these walls, nor, I hope, beyond them, I am happily released from the dread of such hostile criticism, and confidently indulge the hope that the views I have recorded, and which it is now my privilege to submit on the opening of another session, may be received with friendly, and even lenient, criticism.

We live in an age of progress. Nations and individuals are alike engrossed in the keen contest. In politics, in art, in literature, in science, in social and political economy, this is equally true. It matters not greatly whether customs are good, or men are able and useful,—if not conformed to the spirit of the times, they are alike set aside or superseded in favour of modern progressivism. Real progress is the characteristic of a living age. To attain to whatever elevates the aspirations, ennobles the ambition, or promotes the civilisation of man is commendable. But to inaugurate constitutional changes from motives other than the welfare of the community, to yearn for novelty in art, to pander to sensationalism in literature, to preach doctrines which are opposed to the true principles of political economy, these are the outcome of a foolish craze for progress which is a remarkable characteristic of our day. Those who cling with affection to customs which, having been approved by the experience of past generations, they refuse to abandon till convinced that change is necessary,—not for the sake of change,—but for the well-being of society, are apt to find themselves regarded as venerable relics of antiquity, eminently respectable, it may be, but tolerated only because they are so, and destined at no distant date to be swept away in the ever-increasing flood of so-called progress. To attempt to define the extent to which the changes and reforms of modern times may have contributed to true progress would involve an inquiry foreign to my present purpose; it may, however, be asserted with tolerable safety that such changes have not always deserved the name, and that, in not a few instances, they have retarded, instead of forwarding, the advancement of civilisation. With no less assurance may the forecast be made that some at least of the changes with which society is now threatened will fail in attaining the results professedly desired by their advocates, and will end in disappointment, if not disaster. If, therefore, we attempt to review some aspects of our profession, or of interests cognate to it, with the view of defining our position in relation to the past, or of forecasting our probable position in the future, it is of the first importance to be satisfied as to what constitutes progress, and to be on our guard lest, as too frequently happens, we confound it with mere change, or the restless desire for disturbing existing institutions.

Draughtsmanship.

At the outset of such a review we are struck with a remarkable development of recent years,—the perfection which architectural draughtsmanship has attained. It is not possible to regard the drawings submitted yearly for the prizes offered by the Institute and the Royal Academy, or prepared in profusion for competitions, with anything short of admiration, combining as they do technical accuracy with artistic feeling,—the essential characteristics of good draughtsmanship. To set side by side the drawings of some generations since and those of to-day, is to exhibit not so much comparison as contrast; for in many drawings of old masters in architecture, knowledge of perspective and firmness of touch are alike conspicuous by their absence. The perfection of modern draughtsmanship is, no doubt, to be traced, to some extent at all events, to the spirit of emulation inspired by competitions for students' prizes, and to the prevailing practice of inviting competitive designs for public buildings, both of which naturally enlist all the resources of the draughtsman's skill. That this advance in architectural draughtsmanship constitutes, so far as it goes, real progress, may be conceded; indeed, the younger members of the profession may be honestly congratulated on the artistic beauty and perfection of their handiwork. If, therefore, I venture to point out a temptation to which their skill exposes them, I am actuated by no ungracious spirit of desiring to detract from the legitimate merit of their work. No one can doubt the importance of good draughtsmanship to an architect, for it enables him to express readily and freely the ideas which are to constitute his design. The pencil is to the architect what the pen is to the author: the mode of expressing his ideas; no more. Essential as this is, obviously the mode of representation is of less consequence than the thing represented, and it is because I have observed a tendency to drown architecture in mere draughtsmanship that I am induced to remind you that, although every architect ought to draw, and draw with facility, it is yet possible to be a good architect without being a brilliant draughtsman; and, conversely, that it is possible to be an expert draughtsman, and yet not to have any claim to be an architect. Architecture is the material embodiment of conceptions of the mind; drawing is the medium by which these can be, at the best, but inadequately expressed. It may be excusable to smile at the draughtmanship of old masters whose names live in history as great architects, but it may not be amiss for the brilliant draughtsmen of to-day, while justly proud of their attainments, to ponder on their prospects of acquiring equal fame; for while it is good to know how to draw with artistic excellence, it is better to know how to design with purity and truth; the one may be, like a beautiful face devoid of character, the graceful expression of vacuity; the other, like features inspired by character, must be the embodiment of spirit and of life. In architectural competitions the importance of appointing professional assessors is often enforced on the ground that it is impossible for promoters to arrive at a just decision without the assistance of an expert; this is true; but my experience has taught me that there is another side to this question, and that not the least responsible part of an assessor's task is to protect promoters from being imposed on by the tricks of draughtsmen whose ability is more apparent than their morality. Such trickery may mislead the uninitiated; it is transparent to the expert; and at the hands of a just assessor it will not fail to meet with the reward it deserves. In a word, so long as draughtsmanship is the truthful delineation of effects which it is desired to produce, it cannot be too good; when, however, truth is disregarded, and when the temptation is yielded to of producing delusive though attractive effects which the draughtsman knows could not exist, then no amount of technical or artistic cleverness can make it worthy of the art it professes to delineate, or bring it within the sphere of true progress.

Architects' Education.

Drawing being part of an architect's training, it is natural, in passing, to glance, however cursorily, at the more general question of education. Recent years have witnessed vast strides in this direction. The question is not now so much whether people will be educated, as whether they do not incur the risk of over-education. Food is necessary, but excess of food will not assimilate, and is injurious. The progressivism of School Boards involves this danger, and has a tendency to engender discontent by lifting some above the sphere for which they are suited by nature, and in which they would, unless thus surfeited, become useful members of the community. State Education should be elementary. When it embraces higher branches, the advantage, to say the least, is questionable. Modern progressivism, however, has not reached the stage of proposing that free education should be extended to students in architecture, and the risk of over-education, therefore, is one to which we are not as yet exposed; but, apart from such a utopian prospect, which, for all we know, may be in store for our posterity, the educational facilities which students now enjoy are remarkable when compared with those of a generation or two since. Such agencies in the shape of colleges, schools, institutes, academies, and classes are too numerous and too well-known to justify recapitulation; I must, however, notice, in passing, the latest developments exhibited in the remarkable curriculums of University College, King's College, and the Architectural Association. The new departure of the latter in inaugurating a more complete and systematic curriculum of professional education than it had previously attempted was regarded by not a few with some amount of apprehension. A perusal, however, of the annual volume,—the "Brown Book,"—recently published, in which is given the results of the first year's working, must tend to dissipate such fears. The report, which I commend for your perusal, bears the impress of a simple statement of facts, without any apparent effort to make things look better than they really are. A glance at the balance-sheet,—the crucial test of success or failure,—shows that the fees paid by students amounted to the large sum of 645*l.*, which more than sufficed to defray the fees paid to lecturers, amounting to 601*l.*, while the result of the whole year's working, including increased rent and charges, shows the comparatively small deficit of 128*l.* The donations paid to the general fund amounted to 991*l.*, and, after defraying the cost of alteration of premises, furniture, and the above deficit, there remained a balance at the credit of this fund amounting to 480*l.*, to which has to be added donations promised but not yet paid amounting to 359*l.* Without entering into further detail, which the time at my disposal forbids, it will be seen that the progress attained during the first year,—necessarily the most trying and critical,—has been real, and such as to encourage the promoters in the continued and energetic prosecution of the scheme. It is obvious that an undertaking so wide in its organisation, and requiring so numerous a group of workers, could only be attempted in the Metropolis; but we may, without indulging in prospects too sanguine, anticipate the advent of a systematic educational organisation throughout the country. The scheme now under consideration of creating architectural provinces, each with its own centre, and embracing an area with defined boundaries, would certainly tend, by stimulating local organisations, to facititate the attainment of such a result. Existing educational agencies might thus be fostered, and the advantages they offer be brought more prominently before students, and new agencies might be created where none now exist, so that students in each architectural province would not be without those educational facilities which are now enjoyed in the Metropolis. To time must be left the development of such a scheme, for it is apparent that, like all other attainments in real progress, they cannot be forced into existence, but must be slow and gradual in their growth, the outcome of a carefully thought-out organisation.

To what extent architectural education is likely to be affected by the proposed establishment of a Gresham or Teaching University for London cannot be predicated. A Royal Commission is now engaged in taking evidence, and considering the whole question. That such a university must embrace Art, as well as Science and Literature, may be taken for granted, and it would seem reasonable that a definite place should be claimed for Architecture. The scope of the University is thus defined by Professor Huxley in a letter from him which appeared in *The Times* on July 7 last:—

"The University occupies a position altogether independent of general or of technical education. It is neither an institution for testing the work of schoolmasters, nor a machinery for ascertaining the fitness of young men to be curates, lawyers, or doctors. It is an institution to which a man who desires to devote himself to any branch of science or art may go in full confidence that he will find there those who can teach him (or put him in the way of learning) what is already known in regard to that discipline, and still more train him in the methods by which he may himself advance that kind of knowledge. Under art are to be comprehended literature, the pictorial and plastic arts, architecture, and music; under science, logic, philology, mathematics, the physical sciences, and archæology and history. The question of the connexion of the university (in this sense) with the high schools and the technical schools of theology, law, medicine, and so forth, comprehended under the present 'faculties,' and the working in of the present chaotic raw material of educational institutions in London into an organised whole, are matters of detail which will settle themselves as soon as people are agreed upon first principles."

The Examinations.

Teaching naturally suggests Examination. Having devoted a considerable portion of my address last year* to this subject, it would be unpardonable were I now to detain you at any length by recurring to it in detail. I must, however, be permitted to remark that, so far as I know, no advocate of Examination ever thought or expected that it would or could create a great artist or a great architect. It is not fair criticism to condemn an educational test because it does not effect a result which was never intended, and which is impossible. As consistently might University tests be objected to because they do not in all cases produce great divines. No one thinks, however, of disputing that they act as stimulants to the acquirement of knowledge upon which success in life so largely depends. I feel justified in asserting that the Associates' Examination has hitherto successfully withstood the somewhat fierce,—and I feel bound to add the not always just or fair,—criticism to which it has been exposed, for as the practical issue of all that

* See *Builder* for Nov. 7, 1891, p. 344.

has been said and written, the rising generation of architectural students have come forward in increasing numbers, and the cry is, "Still they come!" Does not this imply that they appreciate the active labours of the Institute in endeavouring to raise the standard of knowledge and promote the efficiency of architects, rather than mere academical and inoperative disquisitions? That the Examination may exhibit defects of organisation, or that it may be capable of improvement in certain particulars, is very possible; but that, after all, is no more than may naturally be looked for in a comparatively new institution, subject to such changes as experience may from time to time dictate. Those who may desire to offer suggestions with the view of rendering it more efficient may be assured that any reasonable proposals will always receive careful and impartial consideration from the Board of Examiners, whose generous and unremunerated labours we all appreciate so highly. I desire to record the conviction that the Examination continues to prove,—what I never doubted it would prove,—an encouragement to study and a stimulus to the increase of knowledge, and because it has proved this, it has been, in my opinion, a step in the direction of real progress. I embrace this opportunity to intimate to the architects of the United Kingdom that we invite their co-operation in the endeavour to obtain, for all those about to enter the architectural profession, a systematic course of education tested by examination, and to remind them that the Examination will be conducted in its present form until the end of 1893 only, and that thereafter the progressive Examinations, of which detailed particulars are published in "The Kalendar," will be in full operation.

Qualification of Fellows.

In view of the keen interest that is evinced in the proposed examination or qualification for Fellows, you will, no doubt, expect me to refer to it, and, indeed, I should not be disposed to pass without notice a subject which touches so nearly the interests of the profession and of the Institute. Last year I did not hesitate to express the conviction that, in pursuance of the permissive powers of the Charter, the Institute should declare that, on and after a date to be specified, "every person desiring to be admitted a Fellow shall be required to have passed such examination or examinations as may be directed by the Royal Institute," subject to the proviso that "in special cases the Council shall have power to dispense with such examination or examinations." If I have not since then pressed the consideration of this subject on your attention, it is not because I have seen any reason to alter or modify the view I thus expressed, but because, having, as it were, launched it, I deemed it only right that full time should be allowed for the mature consideration of a project fraught with such important interests. For the same reason, when a definite proposal was submitted to you by Mr. Barry, at the close of last session, the decision you then arrived at to refer the whole subject to the Council, that they might consider it in all its bearings, had my full sympathy and concurrence; for it is scarcely possible that a subject of this nature can be treated in a controversial discussion at a sessional meeting with the same grave deliberation that it is likely to receive in the calmer atmosphere of the Council-room. The subject being still *sub judice* so far as the Council are concerned, I am precluded from treating it in such detail as I otherwise might do, but I apprehend that there is no impropriety in pursuing the course I adopted last year, and placing before you my own opinion, for what it is worth, without in any way pledging the concurrence of the Council in my views. I conclude that all are now convinced, whatever may be their individual opinions as to how the change should be effected, that some change must be made in the qualification for Fellows. It would be inconsistent and intolerable were the present position to continue, for it means that up to thirty years of age men can only be admitted to membership by passing an examination, and that after reaching that age they can be elected Fellows without any such test. This was never intended to be a permanent arrangement, and has only to be stated to secure condemnation. Mr. Barry's proposal is that candidates for the Fellowship should, with certain exceptions, only be elected from the class of Associates. This would practically be equivalent to applying the same test to the primary and secondary classes of members, and does not seem to me, therefore, sufficiently to meet the case. Then, again, there are those who consider that the qualification for the Fellowship should be a separate examination on a higher grade than that for the Associateship. To this the reasonable objection may, I think, be raised that men would thus be called on to undergo an exhaustive and trying ordeal at a time when they are likely to be engrossed with practice, and would not, therefore, have leisure to prepare for it. The resulting issue might, and probably would, be that architects who had already passed the Associates' examination, and who might be demonstrating their ability in their executed works, might be subjected to the indignity of failure simply because they could not give the necessary time for preparation without sacrificing their position or their prospects. It would seem to me unreasonable to expect men, who have already proved their knowledge of the theory and science of architecture by having passed the Associates' examination, to undergo another and a more difficult ordeal of a similar nature, their capacity for which they may have sufficiently exhibited in their works. On the other hand, it seems to me reasonable that the single test of theoretic and scientific knowledge is sufficient, and that, having once satisfied that, the further test or qualification for the Fellowship should be, in addition to what now exists, an examination of the actual work of the candidate. In short, let an Associate be tested as a student; let a Fellow be tested as an architect. To carry this out, it would only be necessary to enact, in accordance with the permissive powers of the Charter, that on and after a date to be specified, every person desiring to be admitted a Fellow shall, in addition to the present qualification, be required to have passed the Associates' examination, and to undergo the further test of submitting to the Council evidence of his executed works, always providing for special or exceptional cases by the dispensing power which the Charter confers on the Council. Such an enactment would remove the existing anomaly that a candidate twenty-nine years of age can only acquire membership by examination, while a candidate thirty years of age can acquire it without any such test; and it would further meet the views of those who, to use the characteristic, if somewhat emphatic, words of Mr. Ernest George, think that "the Institute should relinquish the custom of admitting any respectable father of a family, however damnable his productions." It is not apparent what is the necessary connexion between being the father of a family and producing architectural works deserving of such condemnation, but this Mr. Ernest George will, no doubt, be able to elucidate during the deliberations of the Council. Apart, however, from the somewhat quaint and scarcely reasonable paternal restriction referred to, I understand Mr. Ernest George to mean that the proper test for admission to the Fellowship is the work of the candidate, and in this, as you will have seen, I concur. What better or more fitting test can there be? for it is true—happily or unhappily, as the case may be—that by his works he is already known and judged by the public. For some time past it has been the custom of the Council to request applicants for the Fellowship to submit drawings or photographs of their executed works, a custom to which I have consistently objected, on the ground that it was tantamount to the institution of a test or examination for Fellows which was not sanctioned by the Charter, and was therefore illegal. But the case is now different. We propose to institute such a qualification in accordance with the powers which the Charter conveys, and it consequently becomes not only legal, but to my mind would be equitable, to require an applicant for the higher class of membership to be tested here—as he is judged by the public—by his works. It may be objected that this would be subjecting an architect to examination on what, after all, is a mere matter of taste. I think not. Architecture is much more than a matter of taste, and if this test is applied, it must be a test of architecture. The evidence submitted must be such as will illustrate the candidate's power of design as well as his scientific attainments, and will enable the Council to judge of his title to be, not merely an artist; not merely a draughtsman; not merely a designer; not merely a constructor; no; but the combination and embodiment of all these—in one word, an architect. The Council of the Institute is a body composed of individuals each one of whom, probably, has his own idiosyncrasies and preferences, and his own conception of what constitutes good architecture; but the collective body will, I apprehend, ever be what it should be, the representative, not of a school or a party, but of the profession of architecture, and I can conceive of no adjudicatory court likely to prove so fair and so competent. I indulge the hope that the Council may see their way to present to you in due course a unanimous recommendation on this subject, and that, after full discussion, the Institute may also arrive at a unanimous decision as to the best solution of the problem. Division is to be deprecated. Opinions of course differ,—nor could we expect it to be otherwise. If each one resolves to adhere uncompromisingly to his own opinion, unanimity cannot be attained. Let me venture to urge on all to approach the discussion of this matter in the spirit of friendly compromise, willing to be convinced,—to let good arguments give place to better,—and anxious only that the ultimate decision may be such as may most conduce to the true and permanent interests of architecture, and to the attainment of real progress.

The Institute's Publications.

I desire now to refer to a subject, affecting the internal policy of the Institute, which seems to me of considerable importance. At present the Institute issues three publications annually. "The Kalendar," "The Journal of Proceedings," and "The Transactions." "The Kalendar" is a book of reference affording full information on all matters connected with the Institute, invaluable to many and useful to all. "The Journal of Proceedings" comprises a digest or *précis* of the papers delivered at the sessional meetings, a full report of the discussions to which they give rise, a leading article, and other contributions of literary excellence on subjects of interest to the profession. The volume of "Transactions" is a carefully-edited and profusely-illustrated reproduction of the papers delivered during the Session. Under this system the papers read at the sessional meetings are,—with the exception of Presidential Addresses,—printed, first in the form of an abstract in "The Journal of Proceedings," followed by a full report of the discussions; and afterwards they are printed in full along with illustrations in "The Transactions," followed by an abstract of the discussions. Presidential Addresses, on the other hand, are printed first in full in "The Journal of Proceedings," and afterwards in "The Transactions" in a form in which they were neither conceived nor delivered. Discussions, again, are printed, first in full in "The Journal of Proceedings," along with the abstract of the papers they refer to; and afterwards in "The Transactions" in the form of an abstract, following the full report of the papers. Thus all papers and all discussions are printed twice, once in an abridged form which is practically valueless for reference, and the full reports of the papers, and of the discussions emanating from them, are respectively printed in separate volumes and at different dates. It is difficult to conceive of a system more confusing, inconvenient, costly, and ridiculous, the inception of which it is not easy to account for, the continuance of which it is impossible to justify. It seems, indeed, to combine every disadvantage which a disordered ingenuity could invent, and to deprive members of every advantage that they have a right to look for. What benefit can there be in printing all our papers and discussions twice; in publishing papers and discussions in separate volumes and at different periods; and in issuing the discussions in full at the time they occur, and the papers which gave rise to them months afterwards when both have become ancient history? The true value of a discussion can only be appreciated by those who have either heard or read the paper which inaugurated it, but members,—with the exception of the comparatively few who are present at the sessional meetings,—receive a full report of the discussion without knowing much of the subject as opened, and for the full report of the latter they must wait until after the close of the Session, when the subject, if not forgotten, has probably ceased to be of interest. Thus the printed reports both of our papers and discussions lose much of the value they ought to possess, both for ourselves and for the public.

This brings me to the proposal which I desire

to submit for your consideration, namely, that the separate publications now issued,—"The Journal of Proceedings" and "The Transactions,"—should in future be merged in one publication, to be called "The Journal of the Royal Institute of British Architects"; that such publication should be issued within three or four days of the dates of the sessional meetings; and that it should comprise a full report of all papers and addresses in the form in which they are delivered, with illustrations, and a full report of the discussions, along with such other contributions, articles, critiques, or reviews, as may be deemed of professional interest. In justification of the present system it will no doubt be urged that it would be impossible to publish the sessional papers shortly after delivery, and still more impossible to reproduce the illustrations, without involving the risk of errors, inaccuracies, and defects which are inherent to hasty production, and that, consequently, our "Transactions" would, under such a procedure as I suggest, be deprived of many of the admirable qualities which Mr. White's labours have imparted to them, and would lose much of their value as a permanent record of the literary work of the Institute. This, I admit, would be a result which we should all deplore; but even were it inevitable, which I do not believe, the question might fairly be asked, whether the papers in a comparatively imperfect form published shortly after delivery would not be of more value to members than they now are, issued months later? I am satisfied, however, that the argument to which I have referred is not conclusive, and that there is really no valid reason why the papers, with their illustrations, and the discussions emanating from them, should not be published together, and immediately after delivery. In order to evolve this satisfactosy result it is only necessary that a committee, say the Literature Standing Committee, should become responsible for providing papers to be read at our meetings, and that they should so organise their work as to have papers in hand, say, three months before they are required to be delivered, instead of receiving them from their authors, as is now too frequently the case, at the last moment. If it be urged that this would be impracticable, and that it would be hopeless to expect authors to produce their papers so long before they are required, I reply that what is feasible in the case of other publications should be equally so with ours, and I decline to believe that any difficulties would exist which could not readily be overcome by system and organisation. Ample time would thus be secured for revision by the editor, for printing, and for producing the illustrations beforehand, with the same care and consideration as are now bestowed upon them, so as to be ready for publication within a few days of the date of the meetings.

The advantages attending this proposal are obvious. The papers and the discussions upon them would be printed once only, and would be published together in a complete and permanent form within a few days of delivery. Members would thus have the whole proceedings to peruse and refer to, instead of part only. The convenience of future reference would be facilitated by the papers and discussions being published in the same volume. The single publication would possess an importance, and acquire an influence, which, under the existing system, is unattainable. Lastly, the cost of printing and publishing would be materially reduced, and the income of the Institute would be correspondingly enhanced. I think I do not entertain too sanguine a view when I anticipate a saving of about 500*l.* a year. Thus the consideration of attaining a wider margin between income and expenditure, which I strongly urged in my address last year, would at once be realised. Important as I consider this consummation, I would certainly not urge the adoption of the change by means of which I propose to effect it, were it to militate against the interests of the Institute; but when, as I believe, the much-desired financial result would be attained by a measure which in other respects would be beneficial, and would tend to promote the usefulness of the Institute, directly to its members, and indirectly to the public, I feel no hesitation in most strongly urging you to accept the suggestion which I venture to submit for your consideration. The present system is not conducive to the convenience of members; it militates against the welfare of the Institute; and I am satisfied, therefore, that the change which I advocate would be an important step in the direction of real progress.

The Duke of Devonshire's Drawings.

The list of our Honorary Fellows has been enriched by the addition of the name of the Duke of Devonshire, whose courtesy in responding to our request, and lending to the Institute the unique and valuable collection of the original drawings of Palladio, Inigo Jones, and others, a selection from which was exhibited on the walls of this room on the Gold Medal night, we all thoroughly appreciated.* Thanks to the trouble ungrudgingly taken by Mr. J. D. Crace and Mr. Wyatt Papworth, the drawings have been arranged in proper order, and they have now been returned to the Duke with the renewed expression of our acknowledgments.

Resignation of the Hon. Secretary.

It is with much regret that the Council have accepted the resignation of Mr. Aston Webb as Honorary Secretary, an office the duties of which he has discharged for more than three years with credit to himself and to the benefit of the Institute. Increasing professional engagements having rendered it difficult for him to attend to the work of the Institute, he decided to resign before the last election of the Council, and only consented at our earnest solicitation to remain for a short time longer, on the understanding that he should be allowed to retire before the commencement of the active work of another Session. The regret felt by the Council in parting with so genial and efficient an Honorary Secretary will be fully shared by every member of the Institute, and I trust I may be permitted to express the sense of personal loss which I sustain by his resignation. Had the By-laws permitted it, the Council would have proposed the immediate nomination of Mr. Webb as a Member of Council. This, however, though not possible now, may, I hope, be regarded as only deferred till the next election, when I doubt not his nomination will receive unanimous support; and thus his official connexion with the Institute, whose welfare and usefulness he so much desires to promote, would be continued. The only compensation for a loss so real is the prospect that the office may be filled by a worthy successor; and it is with great satisfaction I am able to intimate that the Council have been so fortunate as to obtain from Mr. William Emerson the assurance that he will be willing to serve, if elected. They have, accordingly, unanimously nominated him for the vacant office. Mr. Emerson is not unfamiliar with the work, having served for some years as a Member of Council; he is interested in the welfare of the Institute; and he is an architect of position and of ability. I cannot doubt, therefore, that the nomination of the Council will receive the unanimous approval of the Institute.

Capital and Labour.

The great question of Capital and Labour, which engages so much attention in the present day, consequent on the oft-recurring and disastrous strikes of recent years, is one which we architects cannot disregard. Capital and labour are alike essential to the execution of our designs. Without them we could produce pictorial representations, but not buildings. Hence, the disturbance of amicable relations between them vitally affects our interests. Labour may be congratulated on the manifest desire now exhibited by society to accord to it fair, and even liberal, remuneration. That this may to some extent be attributed to the stand which workmen have by combination and organisation made in defence of their interests, may be fairly conceded. To combination for such legitimate objects, no reasonable person can, or does, object; but when trade organisations are used for the purpose of imposing arbitrary restrictions on labour, of depriving the workman of his right as a free citizen to work how and as he pleases, or of arbitrarily reducing the hours of work without a corresponding diminution in wages, such as may be dictated by the law of supply and demand, then it seems to me that the real friend of the working man is not his leader who preaches such pernicious doctrines, opposed alike to political economy and common sense, but rather he who bravely warns him of blind leaders of the blind, who, be their motive what it may, are luring him to inevitable and certain disaster. When last year I was—as your representative—invited to settle by arbitration the differences that then existed between the master builders and the carpenters of London, I did not hesitate when making the award to record my conviction that the result of such action had been to inflict permanent injury on workmen by driving their trade into foreign channels from which it was not likely to return. That this has occurred there is abundant evidence. A significant admission of it was, indeed, afforded at the Trade Union Congress held in Glasgow in September, when resolutions were proposed with the view of moving Parliament to prohibit the importation of foreign work and foreign labour. It is true that the proposal proved too much even for the Trade Union Congress, who betrayed no nervous hesitation in adopting any number of resolutions of an advanced socialistic tendency; but it is none the less a sign of the times that such resolutions as I refer to should even have been proposed. That the unsound and unwise policy pursued by the Trade Unionism of to-day, if persisted in, will result in permanently injuring the trade of the country, I firmly believe. The agitation for the statutory restriction of labour to eight hours, or any number of hours arbitrarily fixed, conflicts with the principle of freedom which we have always, and rightly, regarded with pride; it is repulsive to our inborn feelings, and would make slaves of freemen. Man is endowed with energies, with mental and physical powers, not that they may stagnate by limitation, but that they may be used to the utmost in promoting the welfare and comfort of those dependent on him, and the consequent prosperity of the community. No Trade Union, Parliament, or Power, has a right to restrain the energy or restrict the will of any individual. Would that the working men of England would appreciate the danger they incur by limiting their native powers of production, and would see how much better it is to have work on reasonable terms than to drive it away, and then try by arbitrary and delusive restrictions to spread what is left over the wide area of the unemployed which has been created to a great extent by their own short-sighted folly. Would that we could apply to them the words of Matthew Arnold:—

> "In their own tasks all their powers pouring,
> These attain the mighty life you see."

A "mighty life," because free from pernicious limitations, and characterised by the ceaseless concentration of power and energy which constitute the only real highroad to success. A "mighty life," because inspired by teaching which is Divine, to work,—and work with might,—while it is called to-day. When workmen burst the fetters with which Trade Unionism is surely binding them; when they return to the good old days of freedom of contract and earnest work; when they recognise, what is as old as the hills, that "in all labour there is profit; but the talk of the lips,"—of which we hear so much in these later days,—"tendeth only to penury"; then,—but not till then,—may they expect to emerge from the dismal shade of progressive socialism, and walk in the path of real progress.

The Chicago Exhibition.

The World's Fair, which is to be opened at Chicago on the 1st of next May, promises, in point of magnitude and completeness, to eclipse all previous Exhibitions, remarkable as many of these have been. The site allotted for the purposes of the Exposition comprises the enormous area of 1,037 acres, of which, however, it is probable that only 660 acres will be utilised. The Paris Exposition Universelle of 1889 occupied a site of 173 acres,—about one-fourth the size of that of the World's Fair of 1893. The designs of the principal buildings of the Exhibition are the work of different architects, and are said to be "prepared under such conditions as to secure a harmonious effect." The character of the buildings is Classical, and the adoption of one style throughout has, no doubt, facilitated what might appear the somewhat difficult process of harmonising individuality. Separate buildings are devoted to the fine arts; manufactures and liberal arts; agriculture; machinery; electricity; mines; transportation; and horticulture. The interests of Great Britain have been confided to the care of a Royal Commission, consisting of the Council of the Society of Arts, with H.R.H. the Prince of Wales as President. The labours of organisation are distributed among fourteen committees, irrespective of twenty-three local committees throughout the kingdom. The Fine Arts Committee have issued invitations to a large number of painters, sculptors, and architects to contribute works for exhibition, and these, as well as other works of art which

* See *Builder* for July 2 last, p. 8.

may be selected by the Committee, will be insured, transported to Chicago, and brought back, at the expense of the Royal Commission. Drawings should be delivered at the offices of the Royal Commission, John-street, Adelphi, prior to a date of which due notice will be given, probably before the end of the year. The Fine Arts Committee hope that the exhibition of architectural drawings will be such as may be thoroughly representative of the architecture of our day, and worthy of the profession.

Emanuel Hospital.

The retention and preservation of buildings, the antiquity or the design of which imparts to them distinctive interest, must ever command the sympathy and active support of architects. Emanuel Hospital, Westminster, is such a building. It has been much before the public of late, but it had long before engaged the attention of the Standing Committee for Art, and of the Council of this Institute. So long since as March, 1890, when the possible destruction of the building was first contemplated, the Council sought, by influencing the Governors, to secure its preservation, and received from an influential member of that body the assurance that every consideration should be given to the question of saving so interesting a relic of the past. When at a later date it became apparent that the building was in danger of being destroyed, I personally endeavoured, by invoking Parliamentary aid, to avert such a calamity, only, however, to find that such arguments as I could use, based as they were on the importance of preserving a building of architectural interest, and of retaining an open space in a densely-populated locality, were not deemed sufficient to outweigh those that were urged in favour of removal. The decision of Mr. Justice Chitty following soon after, and arrived at after patient consideration of the circumstances, demonstrated to my judgment the futility of further action. The protest which subsequently appeared in the *Times*, signed by gentlemen whose names carry weight in the political and artistic world, although commanding my sympathy, seemed to me to come too late to be of any practical value. I much fear, therefore, —and I say it with great reluctance,—that we must look on the preservation of this interesting,—if not unique,—example of the architecture of the days of Queen Anne as hopeless, a conclusion which cannot fail to be keenly disappointing to all lovers of art, and peculiarly so to architects.

Church of St. Mary Woolnoth.

Another interesting building which has this year been threatened with destruction, and which the Council have sought to preserve, is the Church of St. Mary Woolnoth, the work, as you all know, of Nicholas Hawksmoor, the pupil and friend of Sir Christopher Wren, and a familiar landmark in the City of London. A Bill was promoted in Parliament by the City and South London Railway Company, in which powers were sought to construct an underground railway through the City, and in the exercise of that artistic instinct which is such an eminently distinguishing characteristic of commercial bodies, the Company, with an amount of consideration which must command our gratitude, selected the only edifice in the immediate neighbourhood possessing architectural interest as the site for their station. The Council again took prompt action. I personally interviewed the authorities, and we thereafter petitioned Parliament, on public as well as on architectural grounds, not to sanction the proposal, so far as St. Mary Woolnoth was concerned. The Bill did not reach the Committee stage, but in the event of its being re-introduced our opposition will be renewed. The progressive and destructive spirit illustrated in these cases may commend itself to the severe utilitarianism of the day, but you will, I am sure, concur with me in thinking that the interests of real progress have been promoted by the judicious conservatism which has prompted our action.

The Wellington Monument.

With no small satisfaction may we note that the great work of Alfred Stevens,—the Wellington Monument,—is at length being rescued from the obscurity imposed by the inappropriate position it has occupied for many years, and is now being erected on the site in St. Paul's Cathedral for which it was designed. It will thus be possible for future generations to regard it, alike as a noble monument to the memory of the great soldier it commemorates, and of the great artist by whom it was conceived. For this we have to thank the public spirit and example of the cultured President of the Royal Academy, Sir Frederic Leighton.

New Streets in London.

The projected new thoroughfare from the Strand to Holborn, for the formation of which the London County Council are about to seek Parliamentary powers, appears to have created a good deal of criticism. The scheme has been so long under consideration, and has evidently been so exhaustively dealt with by the Improvement Committee, that the presumption is in favour of the route they propose being the best to meet all the necessities and difficulties of the complex problem. There are those, however, who consider that the suggested street is not required; some who think that as proposed it would not be in the right place; while others, again, prefer a route the continuation of which across the Thames by means of a new bridge would relieve the traffic of Waterloo Bridge. I do not pretend to have sufficiently studied the subject to be a competent judge, but I should have thought that anyone who is in the habit of traversing central London must have been convinced of the necessity of some such main artery as the County Council propose, while I should not advocate the multiplication of bridges across the Thames, except on the ground of proved necessity. The idea of diverting the traffic from the north to the east and west at the southern extremity of the proposed street, instead of discharging it at a single point in the busy thoroughfare of the Strand, is a happy thought which ought to conduce to the convenience of the public. The expediency, however, of laying out the street on the central axis of a line drawn northwards from the centre of the Church of St. Mary-le-Strand appears to be open to doubt. The Church of St. Mary was designed, as we know, to be viewed from the west and east, notably the former, where it forms so charming a feature in the street architecture of London; and from an artistic point of view it is questionable whether it is wise to make it the central feature of a northern thoroughfare, to which it would present a frontage not designed for such a purpose, with the tower and steeple to one side instead of being in the centre of the vista from the north. I am disposed to think that it would be better not thus to accentuate the northern view of the church; and that a happier disposition would possibly be to make Somerset House the central feature by taking a line for the new street a little more to the west than is proposed. There may, however, be difficulties, or objections, of a practical nature to the adoption of such a treatment, and I can only, therefore, submit the suggestion, with diffidence, for what it is worth. The displacement of population involved in this scheme would necessarily be considerable, and I observe that, with the exception of 470 persons whose work and occupations necessitate their being rehoused on the spot, and of 800 persons whom it is necessary to rehouse within one mile of their present residences, the Committee of the London County Council contemplates the removal of the greater proportion of the working-class population, amounting to about 1,800 persons, to the suburbs. This commends itself to my judgment as wise. While fully appreciating the admirable work done by the several companies who have erected improved artisans' dwellings in different parts of London, I yet think that the solution of the overcrowding of the metropolis is to be found in the encouragement of the working classes to reside in the suburbs, and in providing facilities, by means of railways and tramways, to enable them to do so.

Should the scheme of the London County Council to which I have referred be carried out, so noble a thoroughfare will afford a worthy field for the display of architectural skill. I observe that in their report the Committee state that the plan which they recommend would enable "the Council to control the architectural elevation of the new street." Should this mean that the control is to be real, —and not visionary, as in the case of Northumberland-avenue,—and that it is to be exercised by persons competent to deal with the subject, we may regard the proposal with satisfaction; for, under such conditions, architects need not dread irksome interference with their designs, but those who claim to be so, without, —so far as we may judge from their works,— justification, would be properly subjected to control from which the public could not fail to derive benefit. It is to be hoped that architects who may be consulted may be inspired by no lesser motive than the endeavour to educate public taste by adorning a public thoroughfare. Our teaching is not that of a book or a parchment, which may be read or cast aside, nor that of a picture, which may be studied or disregarded at pleasure, but it is engraven in a material form which must be seen and read of all men, whether they will or not. Would that architects who undertake to design buildings for important sites and leading thoroughfares always realised that they incur responsibility, not to their clients only, but to the public also; for such buildings cannot by any possibility remain inoperative; they must exercise some influence for good or for evil on the minds of men, and in proportion as they are inspired by truth and purity, and create correspondingly elevating emotions, are they entitled to rank as works of architecture. Apply this test to one of the most important modern thoroughfares in London. Speaking generally,—for there are, of course, exceptions here as elsewhere,—who will say that the structures in Shaftesbury-avenue adorn it, or create emotions in a cultured mind other than those of irritation and disgust? Buildings they are, certainly, — architecture they as certainly are not. Take another illustration. Who can imagine that the authors of the edifices which have recently been erected on that magnificent thoroughfare, the Thames Embankment, between Waterloo and Charing-cross bridges, or at Albert Gate, realised the responsibility I speak of? One would have thought inspiration would have been derived from the mere fact of designing buildings for such imposing sites, to say nothing, in the case of the Embankment, of the proximity of Somerset House, to the stately proportions and the simple forms of which the eye turns with relief and refreshment.

The Education of the Public Taste.

We hear much said, and we see much written of the necessity of educating public taste. Would that the necessity were more generally appreciated! for, with a really educated public taste, it would not be possible to point to so many illustrations demonstrating, alas! the lamentable absence of taste and refinement on the part of many so-called architects. But, while this is too true; while I witness with dismay splendid opportunities absolutely sacrificed, which might have been and ought to have been mediums for elevating and refining public taste; yet when I recall with a chill shiver the depressing dreariness of an age of stucco and monotony now happily a thing of the past; when I behold the bright and hopeful advent of an age distinguished by the use of genuine materials; when I appreciate the artistic spirit which unquestionably breathes in much of our domestic work; and when I recognise the undoubted desire of all,—whatever their shibboleth,—to promote the knowledge of our art, whether by study, practice, examination, or æstheticism; I gladly record my conviction that the architecture of to-day,—although falling far short of what we long to see, although exhibiting an exaggerated enthusiasm for the element of quaint picturesqueness which I hope at no distant date to see leavened by the spirit of Classic purity and simplicity,—is yet not altogether unworthy of the enlightenment of these latter days, nor altogether out of harmony with this age of progress.

Mr. Eustace Balfour said the agreeable duty had been confided to him of proposing a vote of thanks to the President for his able and suggestive address. He (the speaker) would only venture to refer to one or two points of the address. The President had alluded to draughtsmanship in extremely well-chosen terms; and it was to be feared that too many men regarded draughtsmanship as the end, and not as the means. He had known a great many men, thoroughly first-rate draughtsmen, who had deceived themselves by their mere ability in draughtsmanship. If the buildings which they designed could have been built as they were drawn they would have been beautiful; but unfortunately they were drawn as they could not be built. It had been said of an eminent architect that if he could have built his own cross-hatching his buildings would have been splendid. Another question to which the President had alluded was that of architectural competitions. It was his (the speaker's) misfortune to have to be very often a sort of informal assessor in architectural competitions, and it had occurred

to him that the present system of competitions was absolutely fatal to getting the best results. No private individual would be fool enough to deliberately pledge himself to the acceptance of a design for a building when he had previously debarred himself from having any communication with the designer as to his precise requirements. With regard to the collection of drawings belonging to the Duke of Devonshire, he would like to remind the meeting that there was an enormous collection of such drawings at Chatsworth, which would be found well worth examination and classification. He also thought it most likely that other interesting collections of architectural drawings might be found in other big houses in England. With regard to the President's allusion to labour problems, he did not think it was thoroughly realised by the public in general that the cost of strikes and labour disputes came out of the pockets of the public, and not out of the pockets of the builders and architects. They all knew that builders were in the habit of putting on a large margin for safety when they thought strikes were inevitable. A still more serious matter was the disorganisation which ensued on works when strikes were pending, the foreman having no authority over men who were likely to go on strike at any moment. He himself had been told by a foreman, when he had complained of the bad quality of the bricklayers' work, that he dared not tell bricklayers to carry out the architect's instructions, because the whole lot would go at once. That was a very serious state of things, and he thought that the President had done well in directing attention to the question.

Mr. Paul Waterhouse said it was with very great pleasure that he seconded the vote of thanks. He thought it was fitting, upon an occasion of that kind, that a voice should speak from the body of Associates, who were numerically stronger than the Fellows, and whose thanks to the President were not the less cordial than those of the Fellows. He thought the President was to be congratulated upon the felicity with which he had touched upon so many subjects relating to the welfare of the Institute and its members. In thanking the President for his address, they must not forget to thank him for his services as President during the past year, and for the bright promise that he gave them of his help in the forthcoming year. It was unnecessary for him (the speaker) to emphasise any of the points dealt with in the address; to criticise them would be impertinent, and to object to them would be impossible. The President had spoken of architectural education, and as a member of the Architectural Association he (the speaker) begged to express the thanks of that body for the way in which he had alluded to their first year's experiment. His deliberately-spoken words of encouragement and commendation would be of great service to the Association at the present time. With regard to the subject of the publications of the Institute, many of them felt with the deepest satisfaction that the President had dealt a death-blow to an anomaly. It seemed eminently desirable that such an improvement as he had suggested should be inaugurated without any delay. As to the question of qualification for the Fellowship, he believed that they were on the eve of a change which, carried out on the lines which the President had suggested, would come as naturally upon the former growth of the Institute as a flower from the bud.

Mr. H. H. Langston supported the vote of thanks to the President. He said he had noticed that amongst the other qualifications described by the President as necessary for an architect, he had omitted to say that he should be a man of business. As to the President's criticism of the buildings in Shaftesbury-avenue and on the Embankment, he (the speaker) thought that, whatever their shortcomings, they were preferable to the monotony of Gower-street. He also thought that the President should have laid stress upon the importance of the planning of buildings, as well as on the design of their *façades*. He had been a little disappointed that the President had made no allusion to the Public Health Act of 1891, in the administration of which architects ought to take their rightful part, instead of leaving it in the hands of auctioneers and estate agents.

The vote of thanks having been carried by acclamation,

The President briefly replied. After thanking the members, he said, in reference to a remark made by Mr. Langston, that he regarded the plan as the most important part of a building, and a part which could not be separated from the design. Before closing the business of the meeting, he wished to refer to the question of the election of a new Honorary Secretary. As had already been announced, Mr. William Emerson had been nominated to the vacant office. The Council assumed that there would be no other nominations, and in that case they proposed to proceed to the election at a Special General Meeting, after the Members' Ordinary Meeting on the 21st inst.

The meeting then terminated.

THE ROYAL COMMISSION ON METROPOLITAN WATER SUPPLY.

We continue our *résumé** of the evidence relating to the proposed reservoirs, reminding our readers that this evidence of immediate interest as bearing upon specific engineering proposals has been separated from a larger volume of evidence dealing with geological facts, opinions and theories with reference to the water in the chalk, and the extent to which it may be utilised. Besides the reservoir schemes developed in detail, one proposed by Mr. Baldwin Latham has been mentioned with approval by Mr. Wm. Topley, the geologist; but as it is one to appropriate the flood waters of the Upper Ouse, just outside the Thames Valley, it is understood to be regarded by the Commission as not within the scope of the reference to them, and therefore they abstain from examining it upon its merits. In the same manner other suggestions for going outside the present area escape scrutiny, although some of the supplies indicated are practically nearer London than the remote sources of the Thames and its tributaries. It may be convenient to mention that the later witnesses have included Mr. Wm. Topley, Professor Boyd Dawkins, Professor A. H. Green, Mr. Wm. Whitaker, Mr. Eugene de Rance, and Sir John Evans. In the evidence of these gentlemen is embodied all that geology can at present tell us with reference to the water-bearing strata of the basins of the Thames and the Lea, and some adjacent areas. It seems to be agreed that no additional supply can be obtained from the chalk immediately under London; that large quantities of chalk water are escaping into the lower Thames and into the sea, and may be intercepted, as they are at Brighton and elsewhere; and that some additional water may be pumped in the Kent Company's district. There is, however, more conflict of opinion as to pumping in the Lea Valley. On the one hand, it is said that climatic and other changes account for the lowering of the Hertfordshire streams, which lowering was complained of before the pumping began. On the other hand, it is said that the views of the geologists as to the storage of water in the chalk, its slow movement, and the percolation which must follow pumping, go to show that greater abstractions must ultimately diminish the surface streams. In this connexion a curious question has been raised. Seeing that the water "is so securely locked up in the mass of the chalk," as Professor Dawkins says, that it is forced out at the bottom by pressure at the top, and that the yield is finally ruled by the percolation, it was asked whether the water in the chalk can be regarded as a reservoir and an available supply. Professor Dawkins holds that it is practically available on account of the rapid flow through fissures that will be promoted by pumping; and Mr. Whitaker will undertake to supply London for many years from wells, but believes that by so doing he would dry up the surface streams. Mr. Whitaker, as a geologist, reminded the Commission that it is probable coal may be worked some day in the South of England. If it is, manufacturing industries will spring up, and there will be a great increase of population that will need a supply of water.

Professor Green's Report and Evidence.

Professor A. H. Green, F.R.S., Professor of Geology in the University of Oxford, in the course of a long statement, made the following remarks on the Nine Reservoirs scheme of Messrs. Marten & Rofe:—

No. 1.—River Windrush.—The sources of this river lie among the limestones of the Cotswold Hills, but it soon enters a valley whose bottom is formed of Lias clay. As is invariably the case, under these circumstances, we have a broad, flat-bottomed valley, with gentle slopes, affording no sites for reservoirs. The stream then again enters the porous limestones of the Lower Oolites, and flows over them down to Witney. The rest of the course is over the flat of the Oxford clay. The numerous mills on this stream, specially the important works at Witney, would be entitled to compensation if its waters are to be in any way appropriated, and, in the absence of facilities for the construction of reservoirs, it is difficult to see how this could be done. A site, in the valley of this river above Burford, has been suggested as suitable for an impounding reservoir. It shows in their most typical form the disadvantages that attend sites placed in districts where the subsoil is clay. The length of the suggested reservoir is 2¾ miles, the maximum depth of water 44 ft. The gradient of the valley is fairly uniform, and works out at 16 ft. to a mile. Consequently from a point a mile and a half from the dam there would be, even when the reservoir is full, less than 20 ft. of water, and for the upper three-quarters of a mile the depth would be never more than 12 ft.

No. 2.—A site, which looks tempting, has been suggested on the Sherborne Brook, a feeder of the Windrush. But the reservoir would be situated almost wholly on the open fissured limestone of the Inferior Oolite, some small patches at the bottom reaching down to the incoherent Mitford sands. There is every facility for the escape of the water through these measures, and its discharge into the adjoining valley of Haycroft Bottom. This could be prevented only by carrying a puddle-trench round the greater part, if not the whole, of the reservoir. The depth of such a trench would not be less than 100 ft. and its length 7 miles.

No. 3.—River Evenlode and River Cherwell.—The geological conditions here are so nearly the same as those of the streams already described that there is no necessity to particularise them. But their case presents difficulties which have not so far arisen. The Worcester branch of the Great Western Railway runs along the Evenlode Valley; the valley of the Cherwell is traversed by the Birmingham branch of the same railway, and by the Oxford Canal. Both railways and canal are so little above the level of the stream that any reservoirs constructed in the main valleys would submerge both. The canal also is supplied at various points from the Cherwell. Sites have been suggested in the basins of the Cherwell and the Evenlode, which are objectionable, because they are situated on open porous limestones. One of these near Moreton Pinkney has the whole bed underlaid by pervious marlstone. I do not see how such a reservoir could be made water-tight, except by completely surrounding it by a puddle-trench. The length of such a trench in this case would be at least ten miles. It might be possible to construct reservoirs in some of the branch valleys, and supply them with water taken in part from the main stream higher up. But in some of the cases which I examined such reservoirs would be of large area and small depth, impounding only small quantities of water in proportion to the space they occupied, liable to be drained down and choked by vegetable growth, and in other respects unsuitable as sources for a town-supply. I have found that this would be the case with the following sites that have been suggested in these branch valleys.

No. 4.—On Sor Brook, Broughton, near Banbury. Here, too, the site is wholly on pervious marlstone, and a reservoir could be made water-tight only by works of a most extensive and expensive character.

Nos. 5 and 6.—On River Swere, near Adderbury, and on a stream near Deddington. Both these sites possess, to a large extent, the same disqualifications as the last.

Nos. 7 and 8.—Two other suggested sites are on the river Dorne and on the river Glyme near Woodstock. In both these cases the underlying rock is the limestone of the Great Oolite. To make these water-tight, puddle-trenches at least 150 ft. deep and several miles long would be required.

No. 9.—River Thame.—The conditions in the case of this river valley are very much the

* For reports of previous sittings of the Commission, see last volume of the *Builder*, pp. 418, 435, 456, 480, 503; and current volume, pp. 10, 29, 47, 71, 82, 103, 126, 298, 16, 338, 353.

same as in the case of the river Ray. For nearly the whole of its course it runs over Kimmeridge clay. I should not have thought it necessary to mention this stream at all, if it had not been that a site has been selected on it near Hardwick for an impounding reservoir. This site has all the disqualifications which have been already pointed out as attending reservoirs placed in valleys where the substratum is clay.

In his examination, Professor Green said that he had had many opportunities of seeing reservoirs in the course of construction, and he had mapped a good deal of the country about Banbury, Buckingham, and Oxford. Last year he spent a good deal of time in examining the basin of the Upper Thames and all its branches, and he had more recently examined the sites of the proposed nine reservoirs. In answer to the question, "Have you considered whether any additional supply of water could be obtained for London from the upper part of the Thames basin?" he said,—I came to the conclusion that it was hopeless to attempt anything of the kind. I saw very clearly that, in certain parts of the limestone districts, there were many valleys abundantly supplied with water, and that there were sites in them where the shape of the ground was suitable for the construction of dams that would impound large quantities of water; but I also saw that those limestones were so open and fissured that it seemed absolutely hopeless to make such reservoirs water-tight, except by works of great magnitude and enormous expense far out of proportion to the amount of water they would retain. Then, again, in the clay districts, I noticed that the valleys are broad and open, with very gentle slopes, and that to impound any quantity of water you would have to have very long dams, and that the reservoirs must be all of them shallow. In fact, I came to the conclusion that certain reservoirs might be made which I should not call reservoirs, but which I should call overgrown puddles. They would be water-tight, but I should certainly not think of calling them reservoirs. Overgrown puddles is, I think, the only term I could apply to them. There are other places where you could impound large quantities of water and deep bodies of water, but they would not be water-tight.

No. 1, he added, lies in a broad, flat-bottomed valley, the bottom of which is formed of the Lower Lias clay, a perfectly impervious stratum which may be trusted to hold water certainly. But towards the northern end the reservoir encroaches on the Middle Lias, which is not very thick. The Middle Lias in that district consists of the rock bed at the top and loamy sands underneath. They contain a good deal of argillaceous matter, but are not sufficiently impervious to be safely trusted to. Therefore, part of the puddle trench would have to be sunk down through these Middle Lias beds into the Lower Lias. That would involve no very great difficulty. The thickness probably is not above 30 ft. or 40 ft.; but then there is the danger to be combatted of the water getting round the ends of the puddle wall and escaping that way. That can be met by wing trenches, and these would have to be three-quarters of a mile long on each side. In depth they would, perhaps, not exceed 40 ft. The question is whether the expense would not be out of proportion to the amount of water impounded. A wing-trench must be carried alongside a reservoir for the whole distance that the water rests on the pervious Middle Lias. In estimating the value of the reservoir we must consider its depth. The maximum depth at the lower end is 44 ft., the length 2¾ miles. and for the upper three-fourths there will be a depth of only 12 ft. when the reservoir is full. When it is drawn down you would have three-quarters of a mile of noisome swamp full of all sorts of pestilential growths. But suppose it was merely a compensation reservoir for the Thames? Well, it would send into the Thames practically polluted water, which might perhaps be improved on the way to the intakes.

No. 2 is almost entirely on the limestone of the Inferior Oolite which is a very open jointed porous rock. There are some patches in it which cut a little lower and get into the Midford sands, which are incoherent sands, utterly unable to hold water. The Inferior Oolites spread for a considerable distance all round. A puddled trench must be carried through all the Inferior Oolite down to the Lias clay. It is not easy to estimate the thickness of the Inferior Oolite there, but it is not less than 100 ft. At Cheltenham it is over 300 ft.; near Oxford 30 ft. His impression was that the only way to make the reservoir hold water would be to carry a puddle-trench, possibly 100 ft. deep, all round it. In other words, it was practically an impossible site.

No. 3 would rest almost exclusively on Middle Lias,—the rock bed, which is by far the more dangerous of the two subdivisions. There is very little, indeed, of miscellaneous alluvial deposit. In several places the bare rock bed of the marl comes to the surface. It is not one of those flat-bottomed valleys that is naturally puddled; it is very mouldy, and mounds largely diminish its capacity. The rock bed is always a fissured, ferruginous limestone. The construction of a dam, so that water would not go underneath it, would not be a serious matter, but it is possible the wing trenches might have to go all round the reservoir, one arm of which is four and the other two miles long. He joined issue with Mr. H. Woodward as to the slopes as well as the bottom being coated with clayey material. He could not say whether the marlstone was water-logged or not. Where the stream was flowing, there was a little alluvial matter. The reservoir will be a terribly shallow pan. The maximum depth is only 35 ft., and one arm is four miles long. The sides are too steep to allow of any of this natural puddle lying upon them. Along the sides of these valleys in the Oolite limestone rocks, the bare rocks crop to the surface, or, if it is a ploughed field, the field is covered so thickly with rubble that the bare rock must be immediately beneath that. Really, the sides of the valleys are practically formed of bare rock,—a rock bed of the marlstone. Would not the sides of this valley be Upper Lias, as suggested by Mr. Woodward? The water would not lie on the Upper Lias for more than one-hundredth part of the area. There are one or two outliers of the Upper Lias, and the marlstone just touches them at one or two points.

No. 4 rests very largely, not "wholly," as he had stated, on porous marlstone; but this is the bed where the water would be deepest and the pressure greatest. The sides towards the lower end are almost entirely of marlstone, and for a long way up the south side the upper part of the water would rest on the rock bed of porous marlstone. A portion of the bed is on the Lower Lias, as Mr. Woodward said, but towards the lower part of the reservoir by far the greater part of the water would be resting on the pervious rock bed. Handed Mr. Woodward's map, the witness adhered to his opinion.

No. 5 rests largely on the Lower Lias clay, but touches the Marlstone along the southern margin and at the lower end. Mr. Rofe may have made changes in his plan to obviate difficulties in the making of the dam, but doing that cannot alter the fact that a large portion of the bed will be on the porous rock bed of the Marlstone. The faults have affected the water-tight character of a reservoir very seriously. If it had not been for them, the bed would be on the Lower Lias clay. As it is, they have let in a long strip of Middle Lias, so that it comes to form the bed, a good deal of it probably the rock bed. You have to reckon with the water getting round the end of the puddle wall, and it would be difficult indeed to make the reservoir water-tight.

No. 6 is not open to serious objection as to water-tightness, but it is a horribly shallow pan. It is about 2½ miles long and 35 ft. deep at the lower end, but the upper part would be a mere swamp.

Nos. 7 and 8 cannot be judged by the lake in Blenheim Park. In each case the ground is the same. There is a long, narrow, steep-sided valley, with a flat bottom, covered with alluvial deposit, and fairly water-tight; but the sides in the steeper parts are practically bare rock at an angle of about 20 deg. In the ploughed fields the rubble was so fresh, and the percentage of rubble stones so large, as to show that the rock must be immediately beneath. It was not rubble mixed up with clay; it was lumps of good, clean limestone. The clayey residue would not lie on such a slope, because every shower would wash it down. The lake in Blenheim Park is in such a valley. The agent says, as the result of soundings, that it varies in depth from 14 ft. to 20 ft. The Duke of Marlborough writes that a certain amount of water leaks under the puddle wall, so that, with the small depth of water resting on a naturally puddled bottom, the lake is not water-tight. With 40 ft. or 50 ft. of water resting on this bare rock, he did not see how it could be prevented running away. The lake dam might not have been so well constructed as it would be now, and there is no reason to apprehend that the dam itself leaks, but the water finds its way through the porous limestone underneath the puddle of the dam. In these valleys he did not see how you could make more than just shallow pans, or sheets of ornamental water like that in Blenheim Park, Mr. Woodward mentioned that in the limestone of the Great Oolite, there are layers and bands of clay and marl, and they diminish the permeability of the rock, but there is not enough to render it anything like impermeable. These clayey bands are not continuous; they are wedge-shaped things, and they thin away from place to place. Mr. Woodward has been too sanguine in thinking that the solution of limestone and the accumulation of an insoluble residue over the slopes would make a reservoir practicable. Mr. Woodward has spoken of the lower beds of the upper zone of the Great Oolite as containing so much clay as to be practically impervious; but he could not recall any example that would support that view; and if he were right in differing from Mr. Woodward, a puddle trench would have to go down through the two zones of the Great Oolite until you got to the Upper Lias clay, making a depth of 150 ft. He would not live near one of these reservoirs unless the wing trenches were carried all round, and that would be eight miles or more.

No. 9 would be perfectly water-tight. It would be possible to impound such water as a shallow pan like that would hold. There would be no difficulty or risk.

To Mr. Hill: Some of the sites are eminently unsuitable on geological grounds for impounding large bodies of water. Even a little lake not more than 20 ft. deep is not made water-tight by the sheet of natural puddle. If I had been told they were going to make a lake in Blenheim Park, and I had looked at a geological map, I should have said, "Great Oolite,—it will not hold water." I go there and I find it does hold water, and I want to account for it. The explanation, accepted by everyone, is that there is a sheet of natural puddle, fairly water-tight; but the sheet naturally covers the valley bottom, and does not reach up the slopes. So, directly you raise your dam high enough to bring the water in contact with the slopes, it will run away through the open rock that forms those slopes; and they are so steep that no deposit will rest upon them. The Duke in his letter says, "I do not believe the bed of the lake to be puddled, though I have no certain information on that point."

Additional Sites for Reservoirs.

Mr. Topley made the following suggestions:—

A.—North of Banbury.—An excellent site for a reservoir exists 1½ mile north of Banbury, east of Hanwell, on a tributary of the Cherwell. The reservoir would be on Lower Lias clay, the dam also; but, perhaps, just touching the lower clayey beds of the Middle Lias on its eastern side. The drainage area is about 12 square miles, or 7,600 acres; this is mainly Lower Lias, with a Middle Lias. The district is thinly populated. The area of the reservoir would be about 700 acres; the dam 35 ft. or 40 ft. high in the middle, and about 900 yards long; top-water-level about 360 ft. above Ordnance Datum. The capacity of the reservoir would be probably about 2,000,000,000 gallons.

B.—North of Thame.—On a tributary of the Thame, between Chilton and Chearsley. This reservoir would be on Kimmeridge clay; the extreme northern end on Corallian beds, which are here mainly clay. The drainage area, Kimmeridge and Corallian clays, with outliers of Portland Beds and Lower Greensand, covers about ten square miles, or 6,400 acres. The area of the reservoir would be about 950 acres; the dam about 20 ft. high in the middle, and about 450 yards long; top-water level about 240 ft. above O.D. The capacity of the reservoir would probably be over 1,200,000,000 gallons.

C.—Near Buckingham.—This is a reservoir proposed by Mr. Baldwin Latham. It is on a tributary of the Ouse, but the water could be brought by a cut into the Ray, near Islip. This cut would be from the upper part of the reservoir, the bottom of which would here be excavated. The cut, in part a tunnel, would be four miles long. The drainage area is entirely on Oxford clay, in part covered with drift gravel, clayey gravel, and boulder clay. The dam, just above the village of Padbury, will be cut down

through the Cornbrash, but the whole of the reservoir will be on Oxford clay and the overlying drifts. This reservoir is estimated by Mr. Latham to deliver fifty million gallons daily during 100 days. The floods in the Ouse are a source of much trouble and expense. This reservoir would greatly tend to diminish them, and thus would be of local benefit, besides largely aiding the dry-weather flow of the Thames.

In the course of his examination Mr. Topley said,—There can hardly be any difficulty about the additional sites A and B; they are almost entirely of impervious clay, with just possibly a little bit of the upper part of more or less porous beds which can be dealt with.

Mr. Hill: A would have a dam of 35 ft. or 40 ft. high. If you draw that down 10 ft., there will be very little water left in it, and a large area of the upper part of the reservoir will be all bare?—Yes, that applies to all shallow reservoirs.

Mr. Robt. Etheridge, F.R.S. of London and Edinburgh, submitted to the Commission a paper upon the Upper Thames and its tributaries, exhibited a large map of the river basins, and handed in tables showing the resources of those areas, which amounted, for example, to 20,000,000 gallons daily at Lechlade. He suggested that this water should be stored in reservoirs, which might be constructed at Lechlade, at Castleheaton, at the mouth of the Windrush, and at the mouth of the Evenlode. These were sites where reservoirs could be excavated from the Oxford clay entirely, in order to store water for the purpose of equalising the flow of the Thames. At Cassington one could be constructed partly in the Oxford clay. Another place was Standon, in Hertfordshire; and at the mouth of the Colne, east of its confluence with the Thames beyond Lechlade, a reservoir might be constructed to store the water of four rivers. No reservoirs can be made above Lechlade out of the Oxford clay. No reservoirs can be made in the Colne, Marston Brook, or Cherwell, which could be watertight. Whatever water is to be used is to be taken at Lechlade or St. John's Lock or Weir. The reservoirs he suggested could be constructed only by excavation, not by embankment.

Proposed Leaking Reservoirs.

Mr. Topley, in concluding his evidence, said there was one thing he mentioned with some reluctance, but it had occurred to him as worthy of consideration whether the springs of the upland areas of the Thames,—the underground storage of the porous strata,—could not be artificially increased by the construction of reservoirs that would slowly leak. Engineers, he said, will probably consider it quite a visionary scheme, but it is merely an expansion of an idea which old William Smith, the early English geologist, had, and which he actually applied on a small scale to the supply of Scarborough. He was a great canal engineer, and he suggested that it should be applied to the supply of some of the canals in central England. What I think is that on certain sites which may not be good enough to hold water permanently through the dry weather and so be used as storage reservoirs, it will be possible to build a dam across, keep the water back, and allow it to percolate slowly through the porous rocks and come out as springs. One would want to know whether they would hold water long enough to yield a large supply during the driest weather. It would take a long time for the water to saturate the rocks and run out, and it would overlap the dry seasons. The object is to increase the dry weather discharge artificially by making artificial springs in areas where they are not known, damming the water back in the porous rocks and allowing them to leak. To some extent the joints would be filled up by the deposit brought down by the floods, and that is one of the points of the engineers in recommending sites that are apparently not as good as they might be. Of course, one would not attempt to make such a reservoir as I suggest in an area at all impervious; it should be a moderately pervious area. Possibly some of the reservoirs suggested here would serve the purpose, and two of them would not. If they cannot be made absolutely water-tight they would slowly leak, and in slowly leaking they would make fresh springs, and that would increase the dry weather flow of the Thames.

The Claims of Hertfordshire.

Mr. John Hopkinson, F.G.S., submitted a statement, accompanied by numerous returns, on the rainfall, evaporation, and percolation of the county. These were the results of special study and observation carried on during the last sixteen years. The area of the county is 630 square miles. The conclusions finally arrived at are that the rainfall is 26·05 in.; the percolation 10·30 in., or 39½ per cent. of the rain; and the evaporation 15·75 in., or 62½ per cent. of the rain. The application of these figures is that the county may be injured by pumping for London from the chalk about the point where the Colne leaves the county at Harefield; and the area of the Colne about that point is 235 square miles,—195 on chalk and 40 on tertiaries, Reading beds, and London clay. The county is also affected by pumping in the Lea valley, whose area above Fielde's Weir is 410 square miles,—295 on the chalk, 115 on the tertiaries named. The two areas ordinarily yield 132,000,000 gallons daily, of which 33,000,000 is derived from rain running off impermeable beds into surface streams. It is essentially a winter supply, and the flood waters, coming off heavily-manured land, are unfit for drinking purposes. The rivers are chiefly fed by the natural overflow of the water in the chalk, which finds its way to the surface in springs, most of which are in the banks and beds of the rivers. Where there is no impermeable bed under a river, the water would disappear if the plane of saturation were lower than the river-bed; and it would be lowered by increased pumping from the chalk. To the pumping in the valley of the Lea is attributed the drying up of the Colne at Potterells and at North Mimms, where a mansion with a north aspect overlooks the bed of a river, which is dry, except in wet winters. The Colne joins the Ver, which is now the main stream, but cannot have been so always, else the united stream would have been the Ver and not the Colne. Above the junction the Colne has the greater catchment basin, but the Colne is here much the smaller, because so much water is lost to it in swallow-holes. The Ver drains a large area of permeable beds. If more water were abstracted from the chalk at Watford, Rickmansworth, or Harefield, the springs in its bed would be converted into swallow-holes, and the same would happen to the Gade, its tributary the Bulbourne. and the Chess. Water will percolate more rapidly through layers of flints than through solid chalk. It might be possible to abstract water from a lower bed of flints without immediately drawing it out of a higher, but, as the whole upper chalk is permeable, sooner or later the water in the higher bed must percolate to the lower. Therefore a guarantee that a well will be carried a certain depth into the chalk, and will be steined to that depth and made quite watertight so as to prevent water getting into it from an adjoining stream flowing over the chalk or from some other shallower wells in its vicinity, is of no value. Hence, short experiments to test the effect of pumping in one well upon the level of another are of no value. It may be a long time before the abstraction of water from a deep well affects the flow of an adjoining stream on the chalk, but it is certain that it must eventually do so. In conclusion, he urged that the water raised in Hertfordshire for its towns being returned to the streams before they left the county did not reduce the volume of the Colne and Lea lower down; but if the water were taken from the county and conveyed to London the rivers would be completely robbed of it; and if it were taken from the chalk their volume would be permanently reduced.

Examined upon his statement, Mr. Hopkinson said that his object was to show the proportion of percolation to rainfall, and the amount of rainfall that was available for supply. The mean rainfall he took at 26 in., the percolation at about 6¾ in., and the evaporation at 19¼ in.; or of the rainfall 74 per cent. was disposed of by evaporation and 26 by percolation. This gave daily yields of 57,500,000 for the Colne, and 54,500,000 for the Lea, which ought not to be supplemented by flood waters, because they were unfit for drinking purposes. It was disadvantageous to the county to pump water from the chalk at all. The injurious effects would be felt in dry seasons, but not in wet ones. Too much water was being taken at present. In reply to Sir A. Geikie, he said that he had twice seen the effect of water flowing over the chalk and not percolating. It is so rare that he once went to Hitchin to see it; and he saw it also once in the neighbourhood of Berkhampstead. In both cases the chalk was scooped out, while as a rule the water permeates the chalk. He had seen water disappear from the Colne and the Colne almost dry, and then he had seen the water flowing lower down. Therefore, he assumed that the general flow of the water in the chalk is parallel with the flow of the river. The Bourne flows into the Gade near Berkhampstead, once in a few years, but, when it is dry for the most part, it is seen flowing where there is a little depression in the surface.

Mr. Urban Armstrong Smith adduced many details in support of Mr. Hopkinson's case.

Sir F. Bramwell on Chalk Supplies.

Sir F. Bramwell, examined on that part of his statement which dealt with this branch of the subject, said that the water supply for the metropolis could, he thought, be very largely increased from wells without detriment to the streams on the surface. The East London Company in many places reached the chalk by piercing the clay above the chalk. They found the water in the chalk, and the water rose to a certain height when they were not pumping. That height was much below the depth of the surface streams. If pumping lowers the water-level by 50 ft., that does not bring the surface-water down. Asked "Do you not think it is the chalk-water that flows into the stream rather than the streams into the chalk?" he said, "I think both take place. Where you have chalk-water overlying impermeable clay, there you get a spring going into the streams." He agreed that on the whole the floors of the streams were tolerably impervious, so that water came to them from the chalk, rather than to the chalk from them. If at a distance from where the springs come in you lower the water standing in the chalk below the streams, you do not thereby deprive the streams of anything. If you sink a well and intercept a chalk stream coming out in a spring it would be different; but if you sink a well where the water goes into the chalk, and it has to find its way through subterranean conduits, the lowering of the level of the water in the chalk cannot have any effect on a stream.

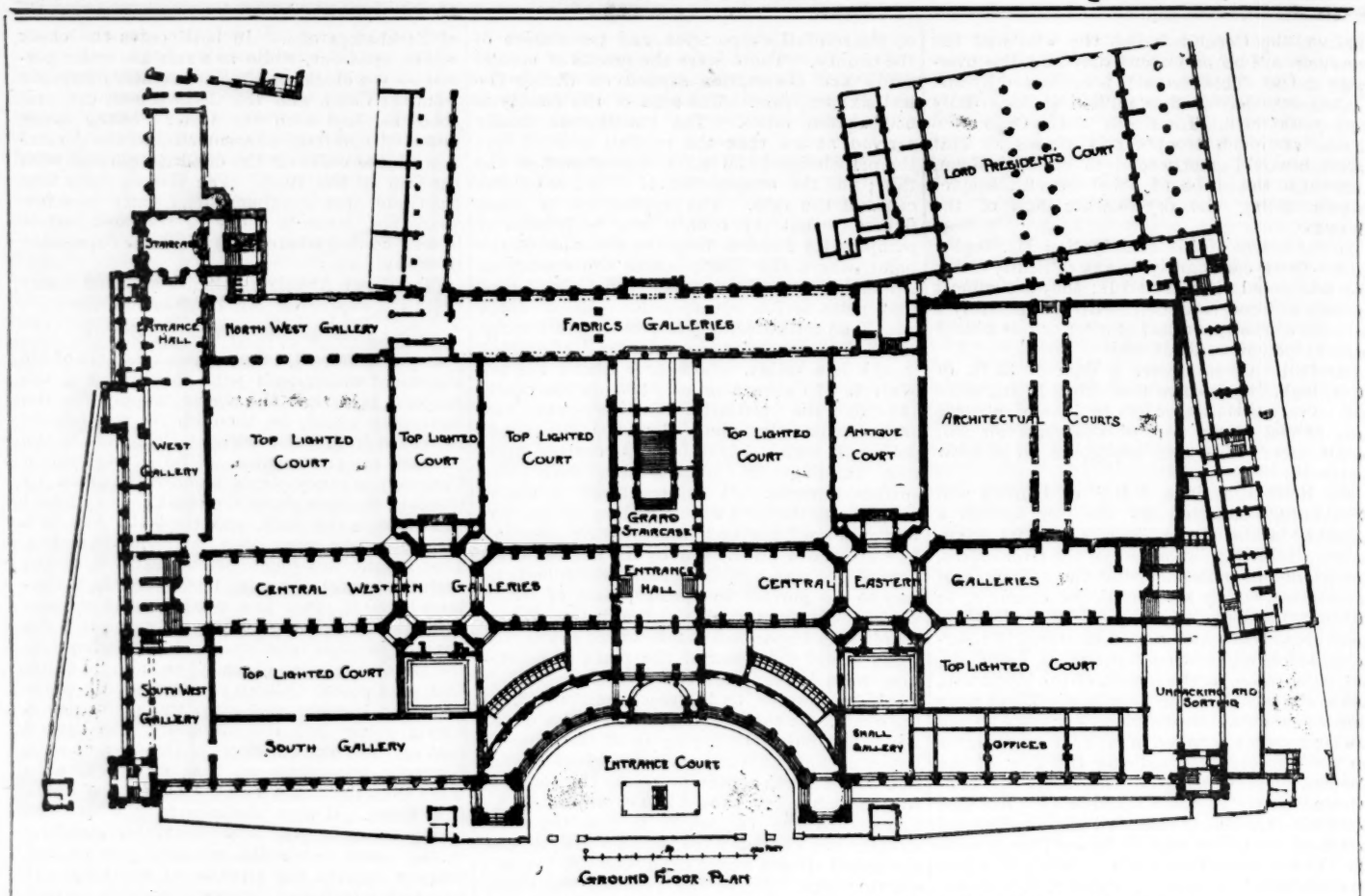
Chalk Supplies from Hampshire and Wiltshire.

Professor Robinson, besides proposing the Kennet Valley reservoir, said that the chalk in Hampshire and Wiltshire would yield a supply for 5,000,000 of people at a capital outlay of not more than 5,000,000*l.*, equal to about 33,000*l.* per million gallons a-day. The working expenses would be about 70,000*l.* a year, or less than one-third of a penny per 1,000 gallons delivered in London, and the softening of the water could be effected at a cost of a farthing per 1,000 gallons. In Hampshire 330 square miles of the upper gathering grounds of the rivers Test and Itchen would yield 77,000,000 gallons a day, calculated on the basis of utilising 6 in. of rainfall per annum from chalk areas, which have a total annual rainfall of 30 in. In Wiltshire, 300 square miles of the chalk area, which includes the Salisbury Plain district, would yield 70 000,000 gallons per day, on the same basis of utilising 6 in. out of a total rainfall of 30 in. These combined volumes, amounting to 147,000,000 gallons per day, could be intercepted at levels varying from 120 ft. to 195 ft. above Ordnance Datum, and pumped into a high-level aqueduct. The average lift for the whole would be 163 ft., which is considerably less than that of the existing waterworks. Out of the total volume of 147,000,000 gallons per day, nearly 100,000,000 gallons per day would be available at the highest level. The water thus intercepted would be pumped, with this comparatively small lift, into a main high-level conduit, and delivered by gravitation to London, to points at an elevation of 240 ft. above Ordnance Datum.

Sir E. Easton on Chalk Supplies.

Sir Edward Easton, C.E., said that he had been in practice forty years, and had designed and constructed upwards of fifty waterworks. Of the nineteen that immediately adjoin or are within Greater London, eighteen draw their water either from chalk springs or from wells and borings sunk in the chalk. These are:—

South Essex.	Watford.	Richmond.
Herts and Essex.	Rickmansworth.	Epsom.
Cheshunt.	South-West Suburban.	Sutton.
Enfield.	Uxbridge.	Croydon.
Tottenham.	Leatherhead.	East Surrey.
Barnet.		Gravesend.
Colne Valley.		



Competition Design for Completing South Kensington Museum: Submitted by Mr. John Belcher, F.R.I.B.A.

One, West Surrey, takes its water from the Thames. He had been personally engaged in constructing the works of South Essex, Herts and Essex, Watford, Sutton, East Surrey, and Gravesend. Water derivable from wells in the districts of the outside companies will be sufficient to provide a supply for those districts for at least double the population. The quantity of water available in the chalk stratum is doubtless very large. Most of the water which is absorbed into it runs by underground channels into the sea, without either appearing on the surface or serving any useful purposes. This is particularly and demonstratably the case in those districts of the chalk which empty themselves below the fault which exists to the East of London. A much larger quantity of the rain which falls upon its surface is absorbed, and much more passes away from it by hidden outlets, than has generally been estimated. Moreover the time during which the water remains in the chalk is much shorter than is generally supposed; that is, there is no such thing as storage for years or even many months. This can be proved most easily by taking the examples of those districts where the area of absorption is defined and the hidden outlets show themselves, as is the case almost always when the chalk abuts on the sea as at Brighton, Dover, Ramsgate, and Deal. At Brighton statistics carried over twenty years show that the rise and fall of the water in the chalk follows the fluctuations in the rainfall with great regularity after from three to four months. Similar observations at the Wisbech waterworks extending over ten years show the same result. At Brighton the water is intercepted in its passage to the sea by means of tunnels, which are driven transversely to the fissures or channels which convey the water, and although out of one set of tunnels there can be pumped at least 5,000,000 gallons at the lowest time, this does not represent the total quantity passing through the chalk, as there is always a flow towards the sea. The area on which this water falls can be pretty accurately ascertained, as its northern limit must be the northern escarpment of the chalk, and its width cannot be taken at more than from two-and-a-half to three miles. About fifteen square miles of chalk probably feed the tunnels of the Brighton waterworks, and it requires 10 in. of percolation to provide the minimum quantity available, whilst at other times of the year the yield of the wells is much greater. On he average, two-thirds of the rainfall finds its way into the chalk. Another proof of the passage of water by hidden channels towards the sea is the fact that rivers and streams fed by a chalk gathering-ground are so much smaller that those from an impervious area. Measurements of bridges on rivers flowing from contiguous watersheds show that in all cases water-ways are four to five times larger for rivers flowing from impervious grounds than those for streams from a chalk district. A much larger quantity of water may be obtained by means of tunnels from the chalk in both Kent, East London, and New River districts by the interception of the streams flowing through fissures and channels into the bed of the Thames.

As we have already stated, the Commission stands adjourned until the 15th inst.

Illustrations.

DESIGN FOR COMPLETION OF SOUTH KENSINGTON MUSEUM.

THIS is the elevation of the design submitted in competition by Mr. John Belcher. In regard to the proposed arrangement of the building, Mr. Belcher writes:—

"The galleries being designed in blocks of two and three stories respectively, this grouping has been expressed in the elevations. The main central gallery of three stories, which covers the lofty Architectural Courts and extends along the full length of the site, has been arranged to maintain the line of frontage of the Natural History Museum. Two domes rise above the octagon galleries, and the height of main gallery returns along the centre portion of the Exhibition-road frontage, containing the Science Library, and is bounded by the furnace tower. In front of the main gallery are grouped the east and west wings containing the two stories of galleries and the offices, and connected by the quadrant forming the recessed entrance court. Four small towers are placed at the angles, two of which form entrances to the quadrant, all grouping together in the approach from the Cromwell-road. The lower two-storied buildings are enclosed by an architectural order which includes the quadrant, and is continuous throughout the whole of both frontages; the upper third story block is grouped behind this on both elevations. In the bays of this continuous entablature which ensures harmony and breadth of design, the treatment of the galleries, staircases, offices, and entrances is freely expressed and varied. On the outer walls of the top-lighted galleries sculpture in low relief is introduced as a frieze, and the tiers of office-windows introduced where they occur. The colour-treatment of stone and red brick has been adopted to harmonise with the existing buildings.

The position of the furnace tower has not only been dictated by that of the heating and warming apparatus, of which it is a necessary part, but is also upon the highest part of the site, and so placed that it does not overpower either frontage or the adjacent buildings.

Interior.—The just proportions of the rooms, convenience of arrangement for exhibition, and the provision of ample light, have been the principles most considered. Among European museums and galleries visited and studied, those at Vienna designed by the late Dr. Semper, an early art director of the Science and Art Department, have afforded examples of the latest experience. The gallery at Dresden, also designed by him some years previously, and the new and old Pinacotheks at Munich, with the National Gallery and the old Museum at Berlin, may be named as illustrations of typical Continental museums, so that the arrangements and scale can be compared with the completed plan of the South Kensington Museum.

The central long gallery, which is 41 ft. wide, is lighted from both sides on the ground and first floors, except where it abuts on the wall of the architectural court.

The top-lighted courts have roofs of the same type as that of the Italian Court, which offers advantages in the arrangements of blinds, &c. The small top-lighted courts are of the proportion of the spans of the Lord President's Court. The sections and plan of the picture gallery roofs have been carefully worked out, it being found that a picture is well lighted if it receives clear light from the sky at an angle of 45 deg., the spectator's eyes being free of direct light and reflected lights from all surfaces avoided.

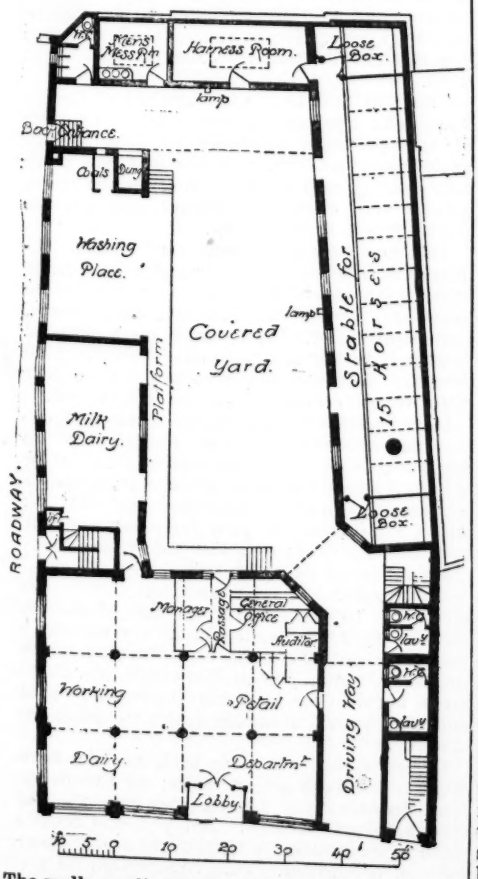
The perpendicular rays of light must be intercepted on the crown of the skylight, being very productive of reflected lights from the floor."

*** As it is not usual with us to publish drawings which have previously been given to other architectural journals for publication,

and as this elevation has appeared in two other journals, a word of explanation may be necessary. Our contemporary the *Architect* published several of the drawings of this design (of course with Mr. Belcher's consent), but as this elevation was there given on a very small scale, and as it has since received a place of honour in the Architectural Room of the Royal Academy, we considered a publication of it on a larger scale was not an infringement of the spirit of our rule. In regard to the other previous publication, we have Mr. Belcher's authority to say that the drawing was published not only without his permission but to his great displeasure, by persons who seem to think that if they are once allowed to get a camera into a room full of competition drawings, the drawings are so much plunder, to be annexed without the ceremony of asking the permission of the architects, or without caring whether they wish it or not. The fault may rest partly with those in charge, who are not sufficiently strict or not sufficiently alive to the architect's right to have his wish consulted as to publication; but it is perfectly certain that no journal which has any sense of an artist's right in his work would publish his drawings without his permission being obtained or even asked for. Not long since we published an indignant letter (much stronger in its original expressions than in the form in which we printed it) from an architect whose design in a competition had been similarly "looted," of course by the same agency; and it will probably be advisable for architects in future, when competition drawings of any importance are to be exhibited, to make a stipulation that their drawings are not to be photographed for publication by anyone who does not show their written permission, which will be the only way to put a stop to these predatory habits.

NEW PREMISES IN HEATH-STREET, HAMPSTEAD.

THE ground floor of these premises is entirely devoted to the business of a dairy company. In front is a large hall, which is partly used as a retail shop, partly as a working dairy, and part is screened off by a walnut-wood framing, about 8 ft. high, to form offices.



The walls are lined with faïence tiles, supplied and fixed by the Burmantofts Company, the iron columns being encased in the same material. The yard at the back is covered by a glass and iron roof.

The first floor, above the milk dairy and washing place, contains dormitories and a common sitting-room for unmarried men in the employment of the Dairy Company. The upper floors, over the front portion, are residential flats. The contractor for the general work was Mr. Toms; the carving on the front was carried out by Mr. Thomas; and the artificial stone paving was laid by the Patent Paving and Construction Company.

The whole of the work was supervised by Mr. Dalton, clerk of works. The architect is Mr. Keith D. Young.

The view of the front of the building is reproduced from a water-colour drawing by Mr. W. H. Atkin Berry, which was exhibited in the last Royal Academy.

BOAT-HOUSE AND ENTRANCE LODGE.

THIS design was made to serve both as an entrance lodge to a country house and the boat-house of a private club. The gatekeeper's rooms occupy the half nearest the Bridge, and are principally on the first floor, and reached by a staircase by the side of the entrance-gates; they include sitting-room, kitchen, and three bedrooms.

The club rooms are entered under the large arch shown in the drawing, and consist of committee and general rooms, and accommodation for the caretaker over. The general room is on the first floor, and occupies the corner with the balcony and turret. The materials are a warm yellow stone for the walls and red tiles for the roof covering. The estimated cost is 1,235*l.*

The drawing, by the architect, Mr. C. E. Mallows, was exhibited at the Royal Academy.

A VICARAGE IN SURREY.

THE accommodation provided by this design is, in addition to that shown on the ground-plan annexed to the illustration, five bedrooms, dressing-room, bath-room, &c., on first floor. The materials proposed are red brick with stone dressings for porch, corbelled course for top story, and for parapet and chimney copings.

Hollow external walls are proposed, and roofing in Broseley tiles.

The architect is Mr. T. MacLaren: the drawing was hung in the last Royal Academy Exhibition.

BRIDGE OF ST. BENEZET, AVIGNON.

THIS rather famous bridge was first built in 1178-1188, but has had a very disturbed existence since. It was cut in 1395 during the siege of the Pope's palace, and inadequately repaired in 1418, but the arch which had been rebuilt fell in 1602, causing the fall of three others with it. Two others fell in 1633, and it is reduced to four arches on the town side.

The floods rise to a great height on the Rhône at this point, and it was perhaps partly with the view of reducing the pressure of the flood water that the spandrels were pierced.

The chapel on the bridge is in two stories, one on the bridge level and the other approached by steps.

The illustration is from a drawing by Mr. A. Needham Wilson.

LEANING TOWER, SARAGOSSA.

THE "Torre Nueva," as it was christened when built, was erected in the Plaza San Felipe in 1504. It leans 10 ft. out of the perpendicular, and is in general appearance Moorish in style, though considerably coarser in detail than genuine Moorish work.

This fine and interesting tower has been condemned for destruction for some months past; in fact, it was announced that it was to be taken down in June, but probably on account of the opposition to the scheme from some of the townspeople, who were not so indifferent as their municipal government to the destruction of a remarkable work of architecture, the destruction was postponed, but has, we understand, been commenced two or three weeks ago, and we presume the tower may be considered as a lost monument by this time. The plea for its removal is that it is not safe in its present position, which would have been a reason for taking it down and rebuilding it on a proper foundation, but not for destroying it.

The height is 70 mètres (230 ft.); the thickness of the walls for the first two stages on the south (to which the tower leans) is 18 ft., on the north 12 ft.; the extra thickness of walling on the south was added in 1860. The central staircase, which has no newel, is 12 ft. across; above these two stages the staircase is built in the thickness of the wall, the centre portion being carried up a closed well with 2-ft. walls, the external walls at this point being 5 ft. thick, diminishing to 3 ft. at the top. The octagon at the bottom is 42 ft. across, at the top 30 ft. (external dimensions).

The illustration is reproduced from a drawing by Mr. H. Rimmer.

THE ARCHITECTURAL ASSOCIATION:

THE APPLICATION OF AN ARCHITECTURAL EDUCATION.

THE second ordinary meeting of this Association for the present session was held on Friday evening, the 4th inst., in the meeting-room of the Royal Institute of British Architects. Mr. H. O. Cresswell, President, occupied the chair.

The minutes of the previous meeting having been read and confirmed, the following gentlemen (forty-eight in number) were elected members:—Messrs. F. S. Short, H. H. Skipper, Cyril Power, T. F. Green, G. H. Smith, G. P. Sheridan, W. H Barrett, A. E. Gardner, F. E. Morris, A. H. Allan, S. P. Brinson, J. S. Lee, P. E. Stenning, E. G. Page, A. Stedman, A. F. J. Cox, C. A. J. Sharman, A. J. Gurney, T. E. Abbott, P. G. Redgrove, B. Hoole, J. H. W. Lake, R. S. Y. Fowler, A. G. Bewes, T. Wallis, F. Lishman, M. G. Pechell, P. Morris, W. H. May, G. O. Scorer, P. Sherrin, M. F. W. Bunney, A. B. Hayward, C. R. Hicks, E. Wheeler, W. J. Waghorne, J. E. C. Shield, J. P. Bishop, G. B. Hoole, C. de Gruchy, S. Perkins, A. E. Dainton, A. W. Pocock, J. H. Coram, J. L. Walker, F. C. Simpson, E. C. Nisbet, and H. E. Y. Haggard.

Mr. William Young, F.R.I.B.A., then read a paper entitled "Notes on the Application of an Architectural Education." After some introductory remarks, he continued as follows:—

A few months ago I was present at a meeting of the Institute, and the discussion was very warm, and everybody in general disagreed with everybody else. At last, towards the close, Prof. Kerr got up and said, "I'll tell you a story." These words were like oil on troubled water, and for the first time that evening there was general agreement in listening to, and heartily appreciating, the Professor's story.

Now, Sir, if I may be allowed, I shall take a hint from the Professor, but with a difference. I shall begin my remarks on the subject by a story,—a little sketch from life,—in place of ending with one. Some years ago, when I was younger than most of you I see before me to-night, I found myself one of a band of young men engaged in the study of art; most of us were students of architecture, but we had one thing in common, we were all enthusiasts for art. We discussed art incessantly,—we agreed and disagreed about it. One thing is certain, just as iron sharpeneth iron we all derived benefit from our interchange of ideas. But not content with the interchange of views amongst ourselves, we thought we could do something for the advancement of architecture. This, it was decided, was to take shape in a magazine devoted to the art side of architecture with nothing of the newspaper in it. This was at a time when the illustrations in the building papers were few, and had not reached the excellence they have attained to at the present day. Well, our scheme had so far advanced that we had a meeting with a well-known printer, to advise us as to the printing and publishing—our friend the printer, an amiable, kind old gentleman, with much experience at his trade, listened patiently to all we had to say, and at the end he replied, "Any one can write a book or a magazine,—and any fool can print it—but it takes a very clever man to sell it."

I do not quote this story to dissuade any of you from becoming authors and applying your architectural education in that way (it shows you the views printers and publishers take), for in spite of the wise advice several of us did blossom into authors. This little glimpse out of the past came into my mind when reading over your Curriculum for the present session. I was impressed with its comprehensiveness. I thought of the time just past when every architectural student had to work out his education in his own way, and I wondered how men like Wren and Inigo Jones acquired their architectural education, without even the aid of the splendid architectural libraries now at our service, and with very little instruction in drawing.

I may safely say there never was a time in

the history of this country when the education of an architect was so well provided for as the present. The student has his course mapped out for him, and facilities are given him which were never within the reach of students of architecture before. Great credit is due to this Association for this good work. You have made it, shall I say, easier, to acquire a good architectural education now then ever it was before,—but, the difficulties of putting that education into practice, are as great now, if not greater, than ever they were. You have given us, or are giving us, the training, and the knowledge, the art, and the power, whatever you like to call it, to design buildings, make plans, and write specifications. But it is the question of the author and the publisher I have just referred to. The difficulty of realising out designs in brick and stone remains undiminished.

The most difficult period in an architect's career is when a young architect begins to turn his education into practice. Remember, I only say it is difficult, not an insurmountable difficulty. Indeed, some of you may get over it as easily as you passed over the *pons asinorum*. Some of you may be born into the way of practice, some may be thrust into it by kind friends, but with zeal and energy all of you may forge your way into it.

Having completed your education, and passed all your examinations,—I am not sure whether you have examinations,—but that does not matter, for the real point for you individually is to have a thorough grasp of all the subjects; the fact of passing an examination will not serve you in the hour of need, but having a firm grip of the subjects will serve you.

In case I may be misunderstood when I say "having completed your architectural education," I mean having completed your architectural education here. For an architect's education is never complete. It is like the brook that goes on for ever; at any rate for every true architect, his education is always going on, and that is what gives the man who has been a long time in practice, and done a lot of work, such an immense advantage. He has an education which only comes by doing much work. It cannot be got in any other way. When you begin to practice you will find the advantage of the education you are receiving here. Have your mind well stored with knowledge, you can make use of it all in the practice of architecture. Know something of everything, and everything of something. That is the ideal education for an architect. But do not lose sight of this fact, that after all education is only the tools with which you are to work. And we judge a man by his work, and not by the tools with which he does it. And it is not the tools you possess, nor any ornamentation in the way of letters after your name, no matter what those letters are, that will make your position as an architect. It is not even reading papers, or giving lectures, or taking part in discussions, or writing letters to the papers, that will make your position as an architect. No; it is your work and your work alone. As a good tree is known by its fruit, so a good architect is known by his work and by his work only.

At the commencement, many of you may look to competitions as one way of applying your education. I am not going into the question of competition, for I do not know much about it. But probably I know more about it than most of you here to-night, both behind the scenes and in front. But I cannot pass this subject, because I believe competition has a fascination for most young architects; I do not think it has for the older ones. Many young men beginning their career as architects regard it as a short cut to success. That idea, let me tell you, is all romance. It would do very well for a novel.

An author, if he should happen to make his hero a young architect, would probably make him enter some large competition, some great public building, and he would get the first premium awarded to his hero, making his design far and away above all the others, leaving the older architects nowhere, but filling them with surprise and envy at the splendid achievement of the youthful hero. No doubt this would go down in a story-book; but that novelist would not be a realist. His picture would not be true to life. No, there is no such thing in the real life of an architect as jumping at one bound to the top of the tree; as in everything else, there must be time for growth. We are not all like Jonah's gourd, that sprang up in a night. If we were, we should be no more enduring.

Your probabilities of success in competitions will be much greater after you have had two or three years' experience in carrying out buildings; your designs will then take a practicable and realisable form that they would not have without this experience

Although I am not a believer in competition, they are an established custom, for the present, which we have to face, and I am not going to say anything that would discourage you from competing. But let me say, I believe you might count all the men who have made a position for themselves, by competition, on your fingers. Few have gained by them, and architects, as a body, have lost by them.

Look for a moment at a competition from a financial point of view. Let us take one for a building to cost, say, 20,000*l.*, twenty-five designs are sent in, and probably a good many more begun and not sent in. Each design would have about ten drawings, and you may put down the minimum out-of-pocket expenses at 40*l.* Take 40 by 25 and you will find the twenty-five competing architects have spent 1,000*l.* in order that one of them may earn a commission of 1,000*l.* It is not as if the successful architect took the 1,000*l.* for the competition drawings. No, he has still to make all the working drawings, &c., to earn his commission just as if there had been no competition.

A commercial man would say this may be art or it may be profession, but it is not good business. But there is a much more serious objection to competitions, which is this: After you have taken every possible pains, and expended skill and labour, not to mention money, and really have produced a design of high merit, you have to face this fact:—That in competitions generally the gate of success seldom swings on the hinges of merit. It is a startling statement to make, but it is a fact. You may dispute it, but you will not be able to refute it, and I repeat it. I say, in competitions generally the gate of success seldom swings on the hinges of merit. It does sometimes; it should always, but it does not. More often it is lifted from its true and natural bearings by the leverage of local influence; aye, even if you should have the assessor's award in your favour; and it has even been known to be held up by the rotten props of corruption. It is for this reason, amongst others, that my advice to you is this: Put not your trust in competition, for the ways thereof are dark and doubtful. Use them if you will, but only as an extra string to your bow, if you use them at all.

If you will compete, use great discretion as to the competitions you go in for. Do not attempt a subject you have no experience in; wait until there is one you understand. The planning of many classes of buildings, such as hospitals, lunatic asylums, and workhouses, is the result of a development by specialists, and you could not make yourself thoroughly acquainted with the subject in the time allowed. Don't attempt too much or too many and stick in the middle. I have known many promising young men who were always beginning things and completing nothing—they were failures on that account. It is a wholesome rule to complete anything you put your hand to—try it, and you will find out its value. Don't give all your thoughts to the elevations to the neglect of the plans. Be strong in your planning if you mean to win. Don't send in scamped and anyhow kind of drawings for the plans and sections and beautiful drawings for the elevations. Don't compete where the conditions are mean or unfair and avoid all competitions which announce three premiums and in a little note at the end informs you the first premium will merge in the commission, as a matter of fact it is only two premiums not three, and they should honestly say so. Some committees think that architects will accept any conditions they choose to impose on them. If architects were united, as they should be, all this would soon be changed. Don't make a design that would cost double the sum stated, an assessor is bound to throw it out. In short, prepare your design and your drawings as if you were going to be saddled with the responsibility of carrying out the work. One of the best things to know about competitions is to know when to avoid them.

I will wind up my remarks on competitions by a little story told me by a client who sat in the House of Commons for about forty years:—An honourable member, who was regarded as one of the most polished speakers in the House, was expected to speak one evening in a debate. The question was one with which he was well acquainted. The hours went by, but the honourable member never once tried to catch the Speaker's eye. He was met afterwards, in the lobby, by some friends, who asked him "Why did you not speak to-night? We all expected you." "Well," he replied, "I intended to speak; but let me tell you I have often been sorry, the morning after, for having spoken. I never yet was sorry for holding my tongue."

I believe it is a fact that on the morning after the result of every competition is made known there are many men sorry for having competed—perhaps sorry would be too mild a word to express the feelings of some of them after they see the accepted design; but if you were to poll the country over you would probably not find one man who was sorry for not having taken part in the competition.

The most interesting individual for you when you commence practice is a client. There are two classes of clients, the private individual and a public body, represented to you by a committee. There are, of course, infinite varieties of both, but they both require management, in the sense of understanding them and their wants (for what they want and what they ask for is often two different things), so as to be able to guide them and get on with them, sometimes a very difficult and delicate thing to do, and requires a great deal of judgment and sometimes much patience. It is a simple enough thing to do when you know how, but as the way of doing it is not taught in the classes, you will only come by it by experience. Some men have the gift intuitively. Some never acquire it, and, in consequence, instead of going on smoothly and pleasantly with their clients and becoming friends it is all the other way, disagreement and differences and dissatisfactions. On such terms the game is not worth the candle.

The great thing is to get your client's entire confidence, and I must say that the comprehensive education you are pursuing here will help you, in a large measure, to this end. For clients ask all kinds of questions, on every conceivable subject, and you are expected to be able to answer at once. If you cannot, they think that you are not so well informed as you ought to be.

You will find that some amount of foreign travel, and a personal acquaintance with some of the principal buildings in Europe, both ancient and modern, and also of these in our own country, will be of much service to you in gaining your client's confidence, and immense service to you in your work.

This necessity of having your client's confidence and being able to manage him, or, in other words, advise and guide him, is the more necessary, for you will find in many instances, probably in most, if you want to carry out good work it is not enough to be able to prepare good designs. You will also have to persuade your client to let you carry them out unmutilated.

If you have a special feature in your design—one on which you pride yourself for its originality and go—it is almost sure to be objected to on the score of expense, or simply because it is original, and they don't like it; and it will depend on your judgment and tact to bring your client round to your views.

A good many buildings are ruined and good designs spoilt by the architect having to give way to his client, in fact, following him in place of leading him. I remember a very terse criticism made on a drawing in the Academy, which was to this effect: Mr. Blank seems unfortunate in always having the vigour and go taken out of his design to please his clients

Committees, I was once told, are the most difficult clients to get on with; my experience is all the other way, I think they are excellent clients to get on with. But you will require some acquaintance with the rules of procedure in committee. This is important for you to learn, for committees are strict as to rules of procedure. See that everything decided upon is put in the minutes, and have a copy of every minute sent to you.

If the work you are engaged on takes a long time the committee at the end may be entirely changed from the one you started with, and you may be the only one left who knows what has taken place; and your acquaintance with

the minutes, &c., will keep them right. They will look to you to do so. If you do not get on with your committee, you will have a bad time, for then comes in the truth of the saying that "a committee has no soul to be saved."

Avoid making speeches in committee; the Committee look upon that as their prerogative. Say what you have to say in a few words. Be always in touch with the Chairman; he has usually a great influence over the other members, and is expected to know everything.

Do not take a committee by surprise. If you want anything important,—an extra 20 000*l.* or so,—don't throw the request like a brick at their heads. Talk things over first with the Chairman and two or three others. You will find that most important business in committee is pretty well agreed upon before it comes formally before the meeting. If your committee take a wrong view of a matter, or are likely to divide in place of being unanimous, get the matter put off until another day,—what you want will then probably come all right. Committees have immense powers, and when they once come to a decision it is almost impossible to get them to alter it.

With committees, as with private individuals, you will find that with a little tact, and being always straightforward and open, and especially being yourself strong,—with sound reason and clear,—as to what you want to do, you will generally succeed in leading your client to do what he ought to do,—or, rather, to let you do what should be done. But if you are undecided yourself, have not fully made up your mind, if you are vacillating and uncertain, then depend upon it your client will often make you do things that will be no credit to you and be no satisfaction to him, and they will blame you for it. And, by the way, let me add emphatically, if you want to manage them, never put on what is called "side." It is detestable under all circumstances, and would at once put a committee against you.

If you manage well, you will find that many a man whom you meet at first only as a client becomes your friend for life, and this management of clients is worth taking trouble over, if you consider that the main object of it is to enable you to do better work,—to save your design from being cut down and spoilt, and so far promoting the practical advancement of architecture. For remember this, one good work does not remain alone, but leads others to do good work.

It was said in this room, and it has been said elsewhere, that after all architects were the servants of the British public, and you will have to give them what they want. Well, I admit we are the servants of the British public, but we will best serve them by giving them what they ought to have and what is best for them.

Some of the British public have strong prejudices and fads; some have even brilliant ideas, which, alas! are impracticable; and if they come and give you a commission to carry out fads and impracticable notions, or schemes which you know to be wrong, and which, if carried out would be a disappointment to them and no credit to you, then, I say, the only true way to serve the British public is not to give them what they want, to oppose them, but to do something more: to show them where they are wrong, and even persuade them to do that which is right. This, in my opinion, is true service, and should be paid for double commission.

I have known instances where it took almost as much of one's time to keep a client from going wrong as it took to do the drawings of what was carried out.

I am not advising that you should take the high-handed course of opposing every suggestion that is given to you by your clients; on the contrary, I think the wise architect is not so conceited as to think no one has good ideas but himself; and he will take any suggestion, if there is any good in it, from whatever source it comes, and apply his skill to lick it into shape.

We are not an artistic nation, and the British public are not hungering and thirsting after art in building, but they will thank you afterwards for giving it to them, even although they may oppose the doing of it.*

MANCHESTER CREMATORIUM.—Messrs. J. & H. Patteson, of Manchester, ask us to state that they executed the mosaic flooring and the urn niches in the crematorium, illustrated in our issue of October 22.

* We will give the remainder of Mr. Young's paper, with some notes of the discussion, in our next.

ARCHITECTURAL SOCIETIES.

SHEFFIELD SOCIETY OF ARCHITECTS AND SURVEYORS.—The opening paper of the present session of this Society was read on the 8th inst. by Mr. J. B. Mitchell-Withers, F.R.I.B.A., its subject being, "The Works of Sir Christopher Wren; with a few Notes on some of the Principal Domed Churches of Europe." The President, Mr. C. J. Innocent, occupied the chair, and there was a large attendance of members. The early history and education of the great architect was briefly sketched, after which the reader proceeded to deal with a few of his architectural works, commencing with the Chapel of Pembroke College, Cambridge, his earliest building; the Sheldonian Theatre, Oxford; the well-known Library in Neville's Court, at Cambridge, and other minor works. From the numerous churches erected in London, he selected the steeple of St. Mary-le-Bow, Cheapside, and the interior of St. Stephen's Wallbrook, giving in each case the criticisms of the principal writers on architecture, notably those of Elmes, Fergusson, Gwilt, and Wightwick. The interior of St. Stephen's was considered by the reader to be Wren's most artistic work, fully justifying the remarks of Fergusson that it is the most pleasing interior of any Renaissance church which has yet been erected. The valuable paper contributed to the "Transactions of the Royal Institute of British Architects," by Mr. Penrose, which carefully investigates its study of harmonic proportions, was referred to. The steeple of St. Bride's, Fleet-street, with its harmonious interior, was described, and after a few remarks on the work at Greenwich and Hampton Court, the author proceeded to deal with Wren's greatest work, the Cathedral of St. Paul's, calling particular attention to those points which have been the subject of fierce discussion, *i.e.*, the screen over the aisles, the wooden conical vaults in the dome, and the awkward arrangement of the arches supporting it. The remark in the "Parentalia" "that the idea of the cupola of St. Paul's was derived from the Pantheon at Rome" suggested to the reader the idea of comparing that building with the London example. The baptistery at Pisa was referred to as having a conical dome of a similar character to that of St. Paul's, after which the cathedral at Florence, some of the leading churches at Venice, together with the Church of the Invalides, and the Pantheon at Paris, were noticed, with several Roman examples. Particular attention was directed to the great Church of St. Peter's at Rome, and the points of difference between it and Wren's work were dwelt upon, as also the transformation of the church from the plan of a Greek cross to the Latin form by Carlo Maderno; the superiority of the former, as shown in Michelangelo's design, was illustrated by drawings by the late Professor Cockerell. Reference was made to the fact that Wren had never visited Italy, but must have had, by means of drawings, an intimate acquaintance with the works of some of the leading architects of the Renaissance school, and the writer considered that he had been much influenced in his work by his acquaintance with Bernini and his studies of that master's buildings. The lecture was illustrated with a number of lantern slides. On the motion of Mr. C. Hadfield, seconded by Mr. H. W. Lockwood, a vote of thanks was awarded to the lecturer.

LIVERPOOL ARCHITECTURAL SOCIETY.—This Society held its second meeting for the present (forty-fifth) session at the Royal Institution, Colquitt-street, on the 7th inst., Mr. H. Hartley, vice-President, in the chair. After some preliminary business, Mr. T. Mellard Reade read a paper on "Questions of the Hour." He referred, among other things, to the probable influence of education on the jerry-builder, from whom came all the bad work of which they had to complain. His conclusion was that the jerry-builder did not want any technical education, and that it would not affect him until he was extinguished by a higher general level of intelligence which technical education might assist in bringing about. Referring to modern architectural ideas, of which he gave a brief historical *résumé*, Mr. Reade pointed out that there was now greater freedom than there was even in the time of the elder Pugin; but there was an increasing indisposition to employ architects to plan houses, the planning being done by speculative builders. Much of this was, perhaps, attributable to the tendency on the part of occupiers to remove frequently. On the other hand, in regard to civic architecture, the architect had now more scope, and a great improvement was taking place in the design of public buildings and in the appearance and beauty of the streets. In conclusion, the reader of the paper referred to the question of beauty in engineering works, animadverting upon the way in which the girders of the Liverpool Overhead Dock Railway spoiled the architectural view from the Pierhead. The company had devoted some extra thousands of pounds towards making this part of their line ornamental, with the result that the work might have been more ornamental if the money had not been spent.

EDINBURGH ARCHITECTURAL ASSOCIATION.—The effects of this Association have, with the consent of the Board of Manufactures, and the approval of the Secretary for Scotland, been transferred to the Royal Institution, Princes-street, where in future the work of the Association will be conducted. The Association's meetings and work classes will in future be held on Wednesday evenings instead of Thursdays, as previously.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of this Council was held on Tuesday afternoon last, at Spring-gardens, Mr. John Hutton, Chairman, presiding.

The Proposed New Street from Holborn to the Strand.—Mr. Frederic Harrison, Chairman of the Improvements Committee, brought up a joint report from the Improvements and Parliamentary Committee in reference to the proposed new street from Holborn to the Strand. The report was as follows:—

"In the report of the Parliamentary Committee presented to the Council on the 18th Oct., it was stated that the portions of the Council's reference on the subject of this improvement, relating to the contribution by owners of ground values to the cost of the improvement, were reserved for a further report. The postponement of the report by the Council has afforded the Improvements and Parliamentary Committees the opportunity of fully considering the matter, together with other financial questions. We have had some difficulty in construing the Council's reference with regard to the incidence of the cost, both in the case of this improvement and in that of the southern approach to the Tower Bridge. The resolution in the one part seems to mean that one-half of the net cost of the improvement is to be borne by the owners of property benefited by the improvements, at the same time leaving to the Committee discretion as to the amount or ratio to be fixed for the equitable division of the net cost of the improvement between the owners of ground values and the occupiers of property. We are advised that the enhanced values or special benefits conferred on property by the new streets will in no case amount to any sum approaching one-half the net cost of the street, and having regard to the fact that the Council has left it to us to recommend what shall be the equitable division of the net cost, we have construed the reference as meaning that half, not of the net cost, but of the enhanced values conferred by the new streets shall be borne by the owners of the properties so benefited. With regard to the equitable division of the net cost, we are of opinion that a moiety of the cost of the improvement should be paid out of a new rate to be imposed by Parliament on the metropolis as a 'Land Values Improvement Rate,' to be charged as in the nature of a land tax in respect of the ground values of property within the County of London, and to be charged upon the owners thereof, with provisions that the same is to be incapable of being made the subject of contract so as to shift the incidence thereof. We are advised by the Parliamentary agent that this charge cannot be imposed on ground values throughout the county by private Bill, but must rest on a public Bill, and that the Bill to be promoted by the Council relating to the street might contain a provision that if any such Land Values Improvement Rate were imposed by any Act of the next session, a sum not exceeding an annuity to be calculated as hereafter mentioned and for a period of sixty years might be charged upon and raised out of any such 'Land Values Improvement Rate' in respect of the cost of the proposed street and scheme; such annuity to be calculated and to be equal, on the 3*l.* per cent. tables, payable half-yearly for a term of sixty years, to a sum of 1,123,000*l.*, being the estimated moiety of the net cost of the street; if this annuity were charged upon the 'Land Values Improvement Rate,' such rate would have to be, according to the estimate of the officers of the Council, at least one penny and a fifth in the *l.* on the estimated ground values of the metropolis.

The following are the recommendations which we have to make:—

'(*a*) That, if instead of acquiring any property within the limits of deviation the Council shall leave

the same in the owner's possession, such property shall contribute (to be secured by way of charge) 50 per cent. of the enhanced value or special benefits conferred upon it and consequent on the carrying out of the scheme as authorised, such value to be ascertained by an arbitrator, with power for the owner to redeem such charge.

(*b*) That, as in the Strand Bill of 1890, a provision should be inserted that improvements made after July 22, 1892, when the scheme was made public, shall not be taken into account in assessing compensation.

(*c*) That a moiety of the cost of the improvement be paid out of any new rate to be imposed by Parliament on the metropolis as a 'Land Values Improvement Rate,' to be charged as in the nature of a land tax in respect of the ground values of property within the County of London, and to be charged upon the owners thereof, with provisions that the same shall be incapable of being made the subject of contract so as to shift the incidence thereof, and that a communication be made to the Local Government Board with a view to the introduction by the Government of a Bill dealing with the subject in the ensuing session.'"

On the motion that recommendation "*a*" be adopted.

Mr. Boulnois, M.P., moved the following amendment:—

"That it is desirable to formulate a scheme which, while fully upholding the principle of the inviolability of contracts, will insure that both the owners and occupiers of house property in London shall directly contribute to metropolitan improvements."

Mr. Urquhart seconded the amendment, which, after discussion, was lost on a division by 75 votes against 28.

Recommendations *a* and *b* were then agreed to.

It was agreed, by consent of Mr. Frederic Harrison, the mover of the motion for the adoption of the report, to leave out the following words in recommendation *c*: "on the metropolis as a 'Land Values Improvement Rate,' to be charged as in the nature of a land tax."

On the motion to adopt recommendation *c* as thus amended,

Mr. Campbell moved, as an amendment,

"That till some means of the Council's obtaining money, in place of the former Coal Dues, and in addition to levy by rate, to carry out permanent improvements has been afforded, the Council considers that the Council's rate should, subject to existing contracts, be divided equally between owners and occupiers as suggested by the Select Committee of the House of Commons on Town Holdings, but that it would be only fair that previously to such division taking effect the County Council franchise should be conferred on owners of ground values; and that the Local Government Board be asked to at once promote a Bill to the above effect."

Mr. Reed seconded the amendment, which was defeated on a show of hands.

Mr. Antrobus moved and Mr. Westacott seconded the following amendment:—

"That, whilst admitting that ground values should bear a fair share of the cost of permanent improvements, and apart from the claim of existing contracts to protection inasmuch as ground values do at present contribute materially to existing rates, the Council cannot accept the proposed imposition of a moiety of the cost of the intended improvements upon such ground values as an equitable division of the net cost, and refers the recommendation back to the Committees for reconsideration."

The amendment was defeated by a considerable majority.

Mr. Beachcroft next moved this amendment:—

"That a moiety of the cost of the improvement be paid out of any new tax or duty, which may be imposed by Parliament on the owners of reversionary interests within the limits of the county; and that it be referred to the Local Government and Taxation Committee to formulate a definite proposal on the subject for the consideration of the Council with a view to the same being submitted to the Government."

This amendment was lost.

The Duke of Norfolk moved that the following words should be added to the recommendation:—

"And that such communication be submitted to the Council before being sent to the Local Government Board."

On a division the amendment was defeated by 62 votes to 40.

Mr. Costelloe moved to add to the recommendation:

"That notwithstanding anything contained in the resolution of the Council, the Parliamentary Committee be empowered to embody in a separate Bill provisions for creating an improvement rate or charge by means of property, and out of such charge provision shall be made for the payment of one moiety of the cost of the improvement, and that the necessary notices be issued."

This amendment was carried by 61 votes to 35.

The Rev. Fleming Williams moved to omit the word "improvement" where it first occurred in the addendum.

This was defeated; and the recommendation, as amended by Mr. Costelloe, was then agreed to.

Resignation of a District Surveyor.—The first paragraph of the Report of the Building Act Committee was as follows:—

"We have to report that Mr. Charles Fowler has resigned the position of District Surveyor for the District of Shoreditch and Norton Folgate. We propose in due course to take the necessary measures for filling the vacancy, and to submit to the Council the name of the person whom we may consider the most suitable for the appointment. We now recommend,—

'That Mr. Fowler's resignation be accepted as from November 7, 1892, and that Mr. H. Lovegrove be appointed as *interim* District Surveyor for the District from that date until the vacancy shall have been filled up by the Council.'"

This was agreed to, and after transacting other business, the Council adjourned shortly after seven o'clock.

COMPETITIONS.

BAPTIST CHAPEL, BLACKBURN.—It was recently decided to erect a new Baptist chapel and school in Blackburn. Invitations were sent to the following architects to submit designs:—Messrs. Morley & Woodhouse, of Bradford; Mr. Baines, of London; Messrs. Stones & Gradwell, Messrs. Simpson & Duckworth, both of Blackburn; and Messrs. Briggs & Wolstenholme, of Liverpool and Blackburn, all of whom complied with the invitation. The Committee, we are informed, have selected the design sent in by Messrs. Briggs & Wolstenholme, and building operations will be commenced without delay. The chapel will be situated at the corner of Granville-road and Leamington-street, and will accommodate 700 worshippers, and will be constructed of brick, with stone dressings. It is in the Romanesque style of architecture. The cost, including the school building, will be over 5,000*l.*

BUILDERS' BENEVOLENT INSTITUTION:

ANNUAL DINNER.

THE forty-fifth anniversary dinner in aid of the funds of this institution was held on Thursday, the 3rd inst., at Carpenters' Hall, London Wall. Mr. Joseph Randall, the President of the Institution, occupied the chair, and was supported by Mr. George Plucknett, J.P. (Treasurer of the Institution), Mr. B. J. Jacob (Master of the Carpenters' Company), Major Isaacs, Mr. W. R. Freeman, Mr. T. F. Rider, Mr. W. Shepherd, Mr. Higgs, Mr. C. Bussell, Mr. T. Stirling, Mr. Bolding. Mr. Hall, Mr. George Burt, jun., Mr. C. Ansell, Mr. Northcroft, and other friends of the Institution, the company numbering about 130.

The Chairman gave the toast of "Her Majesty the Queen, the Prince and Princess of Wales, and the rest of the Royal Family;" and Mr. T. Hill proposed "The Army, Navy, and Auxiliary Forces," which was responded to by Major Isaacs.

The Chairman, in proposing the toast of the evening, "Success to the Builders' Benevolent Institution," expressed regret at the absence of Major Brutton (the Secretary), through illness, and reminded his hearers that the charity was founded in 1847 to give relief and grant pensions to necessitous masters in the building trade and its branches. Since that date no fewer than 252 pensioners had been on the funds of the charity. At present, 54 pensioners were in receipt of relief, viz., 19 men and 35 women, whose average age was 74 years. To maintain so many pensioners, liberal donations were necessary, especially as the annual subscriptions had somewhat fallen off. The men received 39*l.*, and the women 27*l.* yearly, so that the annuities amounted to about 1,700*l.* per annum. The reason why the female pensioners were so numerous as compared with the men was that the widows of pensioners had been admitted on the death of their husbands. The income last year from all sources was 2,056*l.*, and the expenditure 2,070*l.* The Institution had about 700 donors and subscribers,—a number which could and should be largely increased. Many of the pensioners had once been in good and even affluent circumstances, but from causes which they had been unable to control they had been reduced to poverty, with no other resource left them but the benefits conferred by this Institution. It would, therefore, be a great hardship to curtail the annuities of present pensioners for want of funds, or to postpone the election of the five approved candidates, who were in straitened circumstances, and were eagerly looking forward to early election. To those who were as fully acquainted as his hearers were with the vicissitudes of the building trade, and who were aware of the precarious nature of a builder's business and the many risks with which he had to contend, it was not surprising to find so many applicants for assistance. Indeed, the Institute had many more applicants than it could ever hope to support, but that should be an incentive to further effort to increase the funds. He could not help thinking that to reduce the pensions of the aged people now supported by the Institution would be a disgrace to the building trades generally, and to the trades connected with it. The Chairman concluded his appeal by coupling with the toast the name of Mr. George Plucknett, J.P., the Treasurer.

The toast having been duly honoured,

Mr. Plucknett replied on behalf of the Institution, and thanked the President for his anxiety to maintain the charity at its present level.

Mr. T. F. Rider, in a humorous speech, gave "The Worshipful Company of Carpenters," referring to their efforts in aid of technical education, and to their hospitality and benevolence.

Mr. B. J. Jacob (Master of the Company) replied, and expressed the pleasure the Company had in aiding the Institution.

Mr. Freeman proposed "The President," referring to the many important works carried out by Mr. Randall, and his readiness to assist in any charitable object.

The toast was received with acclamation, and the Chairman made a suitable reply.

Mr. Shepherd gave "The Architects and Surveyors," adding that so long as good feeling could be preserved between the architects and the builders, so much the better would it be for both. The builders knew to what a large extent they had to depend upon the quantity surveyors, who were a thoroughly honest and painstaking body of men.

Mr. Tabberer, who responded, said he appreciated the remarks as to the sympathy which ought to exist between the architect and the builder.

Mr. Neighbour also replied on behalf of the surveyors.

The remaining toast, viz., that of "The Vice-President, Committee, and Stewards," was heartily received.

In the course of the evening subscriptions and donations to the amount of 492*l.* were announced, of which sum 400*l.* appeared on the President's list.

Correspondence.

To the Editor of THE BUILDER.

ARCHITECTURE: A PROFESSION OR AN ART.

SIR,—While thanking Mr. Cole Adams for his appreciation of the motives of the essayists whose work he reviews, I regret that we have failed to make our motives and objects clear to him. His letter raises questions which we hoped we had anticipated and answered.

Construction, he says, is a science. In this we entirely differ from him. "Statics and Dynamics," we say, "are Sciences, but Construction is an Art, and, when conjoined with Design, a Fine Art,—in fact Architecture." Being, then, an art, architectural construction, or, in other words, architecture, cannot be learned from text-books, or crammed up for examinations, but can only be acquired by actual practice and experiment.

But when Mr. Adams argues that examination in art is not impossible because men compete for prizes and for employment, he is really trailing the traditional red-herring across our path, and we must refuse to follow him. Competition for a prize is one thing; nobody denies that one can choose the best design and premiate it. But it is a very different thing to decide by examination whether a man is to be allowed to get his bread in a particular way or not.

This brings us to the well-worn fallacy of the professions. As the test of examination is applied to Orders, the Army, the Navy, and the Law, why should it not be applied also to Architecture? But as we have many times tried to point out, there is no analogy between the cases, and Mr. Adams might as well go on to ask "Why not examine for painting, sculpture, literature, the drama, the concert-room, or the Senate?" Public approval or condemnation is the only criterion of fitness in these cases, and so, we submit, must it be with architecture. In the case of Physic Mr. Adams's own analogy fails him, for who would certify a doctor who had not walked the hospitals and worked in the dissecting-room, whereas the Institute will certify as an efficient architect a man who has read about bricklaying in books, but never really seen one brick laid upon another?

We are next accused of being hard on the architect who also practises surveying. Mr. Adams, like Mr. Nevill, assumes that we want to restrain architects from practising as surveyors, and to dictate to them what they

shall or shall not do. Pray let it be understood that we neither wish to dictate to anybody, nor do we propose to prevent any man being a surveyor who pleases. It is not *we* who are clamouring for bolts and bars and strait-waistcoats, or for restrictive Acts of Parliament and close tests for admission. We are glad that every man should enjoy the same liberty of practising architecture, if he can get employment, which we claim for ourselves.

All we say is that if you want to be a good architect you must give all your thoughts and working hours to it, or otherwise you will at best be only a tolerable amateur. This is not our fault. We simply state a fact which experience confirms every day. We blame nobody for not doing what is impossible. It is not we who are hard on the surveyor-architect, but the tyranny of fact, which he would do well to recognise. If it is true, as Mr. Adams says, that most country architects must also do surveying, in order to live, then it follows that most country architects are condemned by fate to turn out bad, or at best poor stuff as architecture. This is no fault of ours, and if Mr. Adams is right, we can only regret that the outlook is so unpromising for architecture in the rural districts.

Finally, we are accused of hostility to the Royal Institute of British Architects, and our book is supposed to be an attack on that body. I for one desire to disclaim all feeling of hostility to that or any other society. The object of our attack is "Professionalism," the professional ideal of the modern architect, and the Institute only comes within our range because it does certainly at this moment form the keystone of the professional system.

The professional system has been tried. Those who think it a success are quite right to go on with it. The Institute, I suppose, thinks so, because it is screwing up the professional ideal higher and higher. Those who are satisfied with the average standard reached by the architecture of the day, and wish for nothing better, may go on as they are. To those who think we may do better if we are only left free to do it, we hope our volume of essays may bring some welcome suggestions of a better way.

THOS. G. JACKSON.

The Student's Column.

CONCRETE.—XX.

TEMPERATURE, ETC.

THE state of the atmosphere has a very great influence on the hardening of hydraulic limes and cements. The scorching heat of summer is almost as injurious as the biting cold of winter. The former is dangerous, because it abstracts the water which is necessary for the proper crystallisation of the lime; the latter, because it freezes the water, causing it, therefore, to swell and crack the mortar, so that sometimes it becomes little better than so much sand. Moist heat hastens the setting of cement, and also its hardening; it is dry heat which is injurious. Only a few months ago a gentleman thought the Portland cement, which was being used in the walls of his house, was of inferior quality; he made a pat of it, and found that it set properly and attained considerable hardness in a few hours, but in a day or two became quite easily friable. The cause was not far to seek. He had kept the pat on a mantel-shelf immediately over a good fire. The writer, to set his mind at rest, made pats of the cement neat and with sand, allowed some to harden in air (not near a fire) and some in water, and found the cement absolutely sound, and of gradually increasing strength. And yet it is not very many years since a correspondent in *The Engineer* advocated the lighting of fires every evening at the feet of mill chimneys in order to set the mortar which had been laid that day. Heat will *dry* mortar, but that is a very different thing from causing it to *set*. Rapid drying is injurious. The rapid drying of floors and roofs may be prevented by covering the concrete for a week or more with a shallow pool of water renewed when necessary, or with a layer of sawdust or sand kept continually moist, or with straw, sacks, &c., which protect the concrete from the direct action of the sun and wind.

Portland cement stucco is seldom sound when executed in hot summer weather, unless great care has been taken in wetting the concrete or brickwork before applying the stucco; protecting the wall as far as possible from the direct action of the sun is also a useful precaution. Warm, damp weather is most suitable for the setting of cement, whether in stucco or concrete, but damp weather, even somewhat cold, is better than extremes either of heat or frost. Variation of temperature is also to be avoided as much as possible. It frequently happens that concrete is exposed to the heat of the sun by day and to keen frost by night, and this is almost sure to cause cracks in the work. Covering the concrete with straw and sacks will afford some protection, but in many cases it will be best to stop the work until the weather is more suitable.

Frost frequently does great harm to concrete, although laboratory experiments seem to show that it does little harm to cement briquettes. A keen frost also prevents all concrete work, by freezing the water of mixture. Various expedients have been tried for the purpose of allowing concrete to be made and deposited during frost, and also of rendering newly-deposited concrete proof against a sudden attack of frost. The object is attained by adding to the water something to lower its freezing-point. The least harmful of such substances is, as far as is known, common salt. We have seen in Chapter XIII. that sea-water, which contains salts of various kinds, has little or no weakening effect on cement, and operations can be carried on with sea-water on many days when fresh water would be frozen. Professor Ira O. Baker, in his "Masonry Construction," gives the following rule: — "Dissolve 1 lb. of salt in 18 gallons of water when the temperature is at 32 deg. [Fahrenheit], and add 1 oz. of salt for every degree below freezing-point." We may add that the freezing-point of water to which 25 per cent. of salt by weight has been added is 7 deg. F., while that of water containing 33 per cent. is 4 deg. F.

Sugar has been ardently recommended by some persons, and undoubtedly it does lower the freezing-point of water so that mortar can be mixed in four or five degrees of frost. It also actually increases the strength of fat lime mortar to a considerable extent, and is said to improve that of some hydraulic limes and natural cements, but on Portland cement it acts disastrously. In Portland cement concrete it must therefore never be used.

Soda has sometimes been added to concrete to render it frost-resisting, but there is considerable doubt as to the success of the operation.

On the whole, salt seems the only substance which is at all successful, and it will be wiser not to resort to the use of this except in cases of urgency. Operations should be suspended, when possible, until the weather is more favourable.

Warm water causes cement to set more quickly than cold, but it cannot be recommended as a preventative of the ill effects of frost, as the heat is soon lost, and, although the concrete may by its aid be properly mixed, the probability is that the frost will have the mastery before it is properly set.

Expansion and Contraction.—The expansion of concrete in hot weather and its contraction in cold weather are now well-known facts, and ought to be guarded against. In their designs for bridges, &c., engineers are compelled to consider carefully the expansion and contraction of iron and steel under changes of temperature, and it is little hardship for us to have to take into consideration the variation of concrete, which is probably only about one-third that of iron. Ignorance, however, of the facts has led to the destruction or disfigurement of much concrete paving, walling, &c. At one time it was thought that cement expanded largely in setting, and that this was the cause of many cracks in concrete. Undoubtedly, bad cement may expand or contract in setting, but in Chapter XII. we showed that the expansion of good air-slaked Portland cement is almost inappreciable. The cracks in concrete walls and paving are most commonly due to changes of temperature, the cracks having a tendency to open in winter and close in summer; for this reason Mr. Thomas Potter prefers laying concrete paving in winter and protecting it with straw, sacks, or other covering, as by this means he considers that the concrete is laid at the time of its greatest contraction, and that any change of temperature simply causes it to expand and compress itself to a greater density. This, at any rate, is ingenious.

In continuous concrete walls, paving, &c., of considerable length, subject to the full effects of the year's changing temperature, cracks frequently occur at moderately-regular intervals. In retaining walls and paving, the cracks are objectionable, mainly because they are unsightly, but in flat roofs, &c., the cracks are a source of danger and give ready entrance to unwelcome rain. The usual method of preventing these cracks is to lay the concrete in more or less distinct masses of moderate size. In the case of retaining walls, a thin strip of wood or plate-iron 3 in. or 4 in. wide, is introduced edgeways into the face-concrete every 20 ft. or 30 ft., and is withdrawn before the concrete has properly set; this forms a kind of joint, which may be afterwards filled with mortar. Paving may be separated into slabs about 10 ft. long in the same way. In the case of large flat roofs resting on iron girders, a strip of wood about $\frac{1}{2}$ in. thick can be placed along the centre of each girder; the strip may extend the full thickness of the roof and will form a guide for the workmen in depositing the concrete. When the concrete has set sufficiently, the wood can be picked out to the depth of 1 in. and the joint filled with mortar or, better, with asphalte; the whole roof can then be finished with asphalte. In the case of large concrete tanks (say, more than 15 ft. long) the concrete should be protected as much as possible from changes of temperature by forming them underground or by filling around them with earth; under such circumstances no fear of cracks from contraction need be feared.

Porosity.—Water-tight concrete is sometimes required, as for the bottoms and sides of tanks, flat roofs, and the ground-layer under a building. It may be said at once that all concrete is not by any means water-tight; the porosity may be due to the nature of the aggregate, as in the case of coke-breeze, soft bricks, friable stone, &c., or may be caused by the bad proportion of the ingredients, which allows voids in the concrete, or may be due to insufficient ramming. The use of too little water in mixing makes concrete less dense than it ought to be. Almost all concrete will allow the percolation of water under pressure, but Mr. Faija found that the forced percolation of water through cement-mortar (1 to 3) improved rather than injured its strength, and that the pores in the mortar gradually filled up, so that at the end of about three months the water ceased to pass through it.* Mr. Cash† found that, when water with a head of 20 ft. was applied to a plug of concrete 12 in. thick, composed of Portland cement, coarse sand, and gravel (1 + 2 + 5), no less than 165 ozs. passed through in the first twenty-four hours, while only 5 ozs. passed through a 12-inch plug made of similar materials in the proportion of 1, 2, and 7, but rendered with cement-mortar (1 to 3), "trowelled on as thinly as possible." On the fifty-fourth day 42 ozs. passed through the former, and 4 through the latter. This shows the great advantage of rendering concrete with cement or cement-mortar, or, in the case of ground-layers and roofs, with asphalte.

Professor Tichborne, F.I.C.,‡ found the relative porosity of certain mortars and cements to be as follows:—1. Common lime-mortar (1 to 2), 100; 2. Plaster of Paris, 75; 3. Roman cement, 25; 4. Portland cement, 10. Asphalte is, he considers, a perfect septum.

Concrete intended to be watertight should be rich in cement, should have sufficient sand (coarse and fine), and sufficient water, and should be well rammed. One part cement, plus two parts sand, plus two or three parts screened aggregate of various sizes, up to about $1\frac{1}{2}$ in., well mixed and rammed, should result in a sufficiently impervious concrete, but a coat of stucco applied to the face of it would be advantageous.

Weight.—The weight of concrete is sometimes important; in the case of floors, for instance, lightness is a point which ought to be specially considered in connexion with the strength. In external walls there can, as a rule, be no objection to heavy concrete, but in internal partition-walls, especially on upper floors, lightness is an advantage. The results of tests by Mr. Grant on the weights of the various concretes mentioned in Table XX., (p. 306, *ante*), are in Table XXII. (next page).

We learn from this table that compression increased the weight of the blocks about 4 per cent., while, as we have already shown, it increased the strength about 27 per cent. The difference in weight between the 6 to 1 and 10

* "Society of Engineers," 1889.
† "Inst. C.E.," vol. cvii., 1891-2, pt. I.
‡ Paper read at Sanitary Congress, Worcester, 1889.

TABLE XXII.

Weight of Portland Cement Concrete in lbs. per cubic foot (see previous page).

No.	Aggregate.	Six to One.		Eight to One.		Ten to One.		Ratios of	
		Compressed.	Not Compressed.	Compressed.	Not Compressed.	Compressed.	Not Compressed.	Weight.	Strength.
1	Ballast	143·2	138·8	142·8	139	141·4	137·6	99	49·1
2	Portland Stone	135·2	125·6	130·5	125	131·5	129·2	91·3	100
3	Granite	148·2	139·2	144·8	139·6	139·2	135·7	99·4	68·6
4	Pottery	128·8	126·8	129·2	125·6	128·7	125·2	89·8	74·4
5	Slag	120·6	118·4	113·6	109·8	112	110	80·4	56·4
6	Flints	132	121·6	131·6	123·2	129·2	121	89·1	56·3
7	Glass	148	142	144	138·4	143·2	135·6	100	58·3

to 1 concretes is only about 3 per cent., the latter being the lighter on account of the greater amount of voids in it. The last two columns are interesting; they show that ballast and glass make very heavy but very weak concrete, that slag makes moderately light and very weak, and that Portland stone and pottery make concrete heavy but strong, Portland stone giving the greatest strength of all.

The weight of concrete varies also according to the amount of sand it contains; a concrete having too little sand will be more porous, and, consequently, lighter than one containing more sand, other things being equal. Again, the weight of different kinds of the same class of aggregates varies largely; *e.g.*, different sandstones vary in weight from about 116 lbs. to 170 lbs. per cubic ft., and the weight of the concrete made with them will vary in the same proportion.

For these reasons, it is impossible to give a table of weights of concrete which shall be of much value. It may, however, be said that coke-breeze concrete will weigh from 70 to 80 lbs. per cubic foot; burnt-clay concrete about 100 or 115 lbs.; brick concrete about 120 lbs.; gravel or shingle concrete from 130 to 145 lbs.; and granite concrete from 135 to 160 lbs. Concrete made with broken limestone or sandstone will vary from 110 to 150 lbs., according to the weight of the stone.

OBITUARY.

MR. J. W. WILD.—We regret to hear of the death, on the 7th inst., at 13, Lincoln's Inn-fields, of Mr. James William Wild, Curator of the Soane Museum. From information communicated to us by his family, we learn that he was born on March 9, 1814, and was consequently in his seventy-ninth year. He was the son of Charles Wild, a well-known artist in his time, a Member of the old Water-Colour Society, and author of "Wild's Cathedrals." In early life he inclined to Gothic art, his friends regarding St. Saviour's Church, Southampton, as his best example. He joined Dr. Lepsius's expedition to the East, sent by the King of Prussia in 1842, and discovered the construction of the Great Pyramid. He lived several years in Damascus and Cairo, and studied deeply the mosques and domestic architecture of the Arabs, on which he was considered a good authority. In his investigations he adopted the native dress, in order to penetrate the mosques, and he has left behind a great many beautiful sketches of details. Inspired by Byzantine art, he built St. Mark's Church, Alexandria, St. Martin's Schools, Endell-street, and Christ Church, Streatham. He was connected for several years with South Kensington Museum as referee concerning Arabian art. While there, the British Legation at Teheran and the Bethnal Green Museum were built from his designs. For the last fourteen years he was Curator of the Soane Museum, Lincoln's Inn-fields. During the last three years of his curatorship, the present Trustees undertook the enlargement of the Museum, which has been carried out under the direction and from the designs of Mr. Wild.

MR. H. J. MARTEN, M.INST. C.E.—The death is announced, as having taken place on the 3rd inst., at his residence, "The Birches," Codsall, Wolverhampton, of Mr. Henry John Marten, M.Inst. C.E., in his 66th year. He had lately given evidence (published in our pages) before the Royal Commission on Metropolitan Water Supply, as to a scheme of nine storage reservoirs, proposed by him in conjunction with Mr. Rofe.

THE WIDENING OF LUDGATE-HILL.—The progress of this improvement, begun twenty years ago at the southern end, has been described from time to time in our columns. The project is now practically completed by the recent demolition of the houses by the corner of St. Paul's-churchyard, and a recommendation by the City Sewers Commission to pay 20,000*l.* to Messrs. John Howell & Co. for their interest in some property there.

GENERAL BUILDING NEWS.

MUNICIPAL BUILDINGS, BATTERSEA.—The foundation-stone of the Battersea Municipal Buildings and Town Hall, situated in Lavender-hill, was laid on the 7th inst. by Mr. Edward Wood. The architect is Mr. E. W. Mountford, and the builder Mr. W. Wallis, of Balham. The buildings will cost over 26,000*l.* The materials employed are red Suffolk bricks and Monk's Park (Bath) stone for the walls, the roofs being intended to be covered with thick green Westmoreland slates. The frontage to Lavender-hill is 110 ft., the principal entrance being in the centre. The entrance hall measures 54 ft. by 30 ft. and round it are grouped offices for the transaction of the business of the Vestry and board of churchwardens and overseers. The grand staircase to the first floor springs from the entrance hall facing the vestibule, and will have balusters of pink Devonshire spar, the plinths and hand-rails being of polished Devonshire marble. The council chamber, which will occupy the front central position of the first floor, will be 54 ft. by 35 ft., and will have a committee-room at each end. A large gallery is to be provided in the council-chamber for the accommodation of the public, which will be approached by a separate staircase from the new street on the eastern side of the buildings (Town Hall-road) and by a corridor on the second floor. The large public hall is to be in the rear, with a separate grand entrance from the Town Hall-road, and will have other entrances also from this road and from the footway, which extends along the whole of the western side of the buildings. This hall will be 117 ft. in length by 55 ft. 6 in. in width, and will seat 1,200 persons. Beneath the large hall there will be a smaller hall measuring 55 ft. by 38 ft., and in connexion with both halls the necessary reception, cloak, and retiring-rooms will be provided. The contractors for the constructional ironwork (cast and wrought) have been Messrs. W. H. Lindsay, Neal, & Co. Elevations and ground floor plan of the building appeared in the *Builder* for December 19, 1891; and a view of the principal staircase in the *Builder* for July 9, 1892.

A NEW "PALACE OF VARIETIES" AT EDINBURGH.—On Monday last a new theatre was inaugurated in Edinburgh, under the designation of "The Edinburgh Empire Palace, Limited." It occupies a situation between Nicholson-street and Potter-row, where formerly stood a circus, which was destroyed by fire. The principal entrance is from Nicholson-street, between a row of shops, and the body of the building does not, therefore, lend itself to external architectural effect, but over the entrance there is a tower which calls attention to the existence of the building in the rear. The entrance hall is of highly ornate character, and leads to a marble staircase, upon which has been lavished a profusion of ornament. It is carried up to a large landing in two separate flights, between which is a grotto with water falling over rocks into a large basin, with palms and ferns interspersed. Over this there is a ceiling painted to represent the sky, with birds and starlike electric lights. Entrance to the principal parts of the house is obtained from this landing, and to the gallery from Potter-row in the rear. The centre of the ceiling is taken up by a glass and iron roof, under which is an octagonal dome, with enrichments. The glass roof can be removed in a few minutes, and discloses to view the enriched ceiling. The stage, which is 75 ft. wide by 40 ft. in depth, can be removed in a few hours, and transformed into a circus, while the ordinary stage opening can be enlarged by a mechanical movement of the sides of the proscenium. The building, from the designs of Mr. Frank Matcham, of London, is of fireproof construction. A fireproof curtain divides the stage from the auditorium, and all promenades, passages, and staircases are wide, and constructed of concrete and iron, and each part of the house is furnished with hydrants and other means of extinguishing fire. The following local and other firms have been engaged in the construction and fitting up of the new building:—Contractors, Messrs. Drysdale & Gilmour, Edinburgh; Fibrous Plaster Work, The Carton Pierre Co., London; Painting Decorations, Messrs. J. Binns & Sons, Halifax; Gas Fitters, Messrs. Robertson & Cairns, Edinburgh, and Mr. Tollerton, Leeds; Electric Lighting, Edison Swan Co., Limited, Manchester; Sliding Roof and Special Iron Construction, by Messrs. Whitford & Co., London; Marble Columns, Floors, &c., by Messrs. Gunn & Co., Edinburgh, and Messrs. Bellman, Ivey, & Carter, London; Hydrants and Plumbing, Messrs. Barton & Sons, Edinburgh; Hot Water Heating, Messrs. Crumblehulme & Sons, Bolton; Upholstery and Curtains, Mr. A. R. Dean, Birmingham; Carpets, Linoleum, Messrs. Paterson, Smith, & Innes, Edinburgh; Tip-up Chairs, Messrs. Cranston & Elliot, Edinburgh; Fireproof Curtain, Messrs. Stones, Limited, Ulverston; Drop Scene, Mr. Frampton, Sunderland; Cascade Rockery and Floral Decorations, Messrs. Dicksie & Co., Edinburgh.

VENNAL CHURCH, EDINBURGH.—We understand that extensive structural alterations are to be made to the Old Vennal Church, Edinburgh. The work has been placed in the hands of Mr. J. Williams Dunford, architect, of London.

THE EXTENSION OF ABERDEEN UNIVERSITY BUILDINGS.—The plan of building extension now adopted by the University Court is, says the *Scotsman*, estimated to cost about 90,000*l.* It comprises the extension and completion of the quadrangle at Marischal College by the extension of the north wing to accommodate the departments of chemistry, pathology, surgery, medicine, and law; the erection of a new front block facing Broad-street, accommodating the administrative offices, University court-room, faculty-room, committee-room, secretaries' rooms, and lady students' rooms, also the departments of botany and agriculture; and the erection of a new graduation hall and students' rooms in the rear of the present buildings, and connected with the existing hall and library and museum; likewise of the re-arrangement and addition to the department of anatomy. The plan also provides for the erection at King's College of a new natural philosophy department and for students'-rooms, including accommodation for ladies. The external appearance of the Marischal College buildings will resemble the original design, the only change on the plan being that the hall is placed at the back in connexion with the existing halls instead of in the front block, which is now to be devoted to administrative offices, botany, and agriculture. The architect is Mr. Mackenzie, of Messrs. Matthews & Mackenzie, Aberdeen.

NEW BANK PREMISES, LIVERPOOL.—The new head offices of the Adelphi Bank, Liverpool, at the corner of Castle-street and Brunswick-street, were recently opened for business. The building, designed by Mr. W. D. Caröe, of London, shows a free treatment of the early sixteenth-century style of France. The vertical pilasters, says the *Liverpool Post*, are in five instances terminated in figures, representing Peace, Plenty, Prudence, Justice, and Fortitude, these figures and their niches serving to carry up the vertical treatment through the second floor, when it gives way to a fresh motive in the third floor story, which really surmounts the main cornice. Advantage has been taken of the corner site to secure an entrance door at the angle. The bronze doors are from the design of the architect, and have been executed by Messrs. Starkie Gardner & Co., of Lambeth. The figures and plaques are due to Mr. Stirling Lee, the sculptor. A wood-groined vestibule leads to the banking hall proper, which is lofty and well-lighted. The walls are pannelled in marble of several quiet tones, of which grey and ivory predominate. The fittings are in English oak. The ceiling was modelled by Messrs. George Jackson & Son. A bullion lift leads to the basements, which are in glazed bricks throughout, and fitted with burglar-proof appliances by Messrs. Chubb & Sons. The main staircase to the general offices has been designed so as not to confine the space in the banking-hall or to break into the general area. It is relieved by a passenger-lift which serves the upper floors. The bank board-room is in unpolished teak. The building work was executed by Messrs. Roberts & Robinson; the marble work and decorative carving by Messrs. Norbury & Patterson; the English oak fittings by Mr. Dart, of Crediton; the gilding and decorative painting by Messrs. Halpen & Co.; and the electric light fittings (also from the architect's design) by Messrs. Cox & Buckley, per Mr. R. Rathbone.

NEW WORKSHOP FOR THE BLIND OF KENT, LONDON-STREET, GREENWICH.—This building has been erected from plans of Mr. W. F. Harris, architect, by Mr. J. F. Collinson, builder, of Teddington. The cost has been defrayed from a fund left by the late Mr. Nasmyth (inventor of the steam-hammer), and the workshop will be a great boon to the blind, as it will enable them to earn their own living at suitable trades which they have been taught. The building is in a prominent position in the main thoroughfare; the front is built of red brick, with Portland stone dressings. The ground-floor windows have mahogany sashes and plate glass, to be used as shop-windows to exhibit the wares made by the blind. The whole of the building will be used as workshops, where baskets, mats, and other useful articles will be made. It is warmed by Grundy's hot-air apparatus.

NEW CHANCEL, ST. PAUL'S EPISCOPAL CHURCH, EDINBURGH.—On the 14th ult. St. Paul's Episcopal Church, York-place, Edinburgh, was re-opened by the Bishop of Edinburgh after undergoing alterations, including the erection of a new chancel. The

church as originally designed consisted of a nave, north and south aisles, and a short chancel 15 ft. long. The nave consisted of five bays of a total length of 78 ft., with a gallery over the entrance at the west end, in which was placed the organ. The galleries were continued over the aisles, with access stairs flanking the main entrance at the west end. In designing the new chancel, the original east termination of the church has been preserved, merely extending it by the distance required for a chancel in keeping with the length and other proportions of the nave. As it was decided at the same time to remove the galleries, the space formerly occupied by the stairs has been added to the nave, which is now one bay longer than before. The new chancel is equal in length to three bays of the nave, about 50 ft., and the organ is now placed in a bay next the nave, with stone piers and arches opening to the chancel and the south aisle. Beyond the space occupied by the organ is the clergy vestry, and below it is the choir vestry. Under the chancel there is a choir room, and off it are the organ bellows and hydraulic engine. The church has been re-seated, and oak choir and clergy stalls have been placed in the chancel. The glass of the original east window has been transferred to the west window, and the east window and south-east chancel windows have been fitted with stained glass by Messrs. Heaton, Butler, & Bayne. The internal length of the church from the west to the east wall is now over 140 ft. The architects were Messrs. Kinnear & Peddie, of Edinburgh.

ADDITIONS TO ST. JOHN'S CHURCH, KIDDERMINSTER.—On the 22nd ult. the foundation-stone of the new nave and chancel of St. John's Church, Kidderminster, was laid by the Countess of Dudley. The present church was built about fifty years ago, and, although the fabric, which is of blue bricks, has received attention from time to time, it is now in a serious state of disrepair, and it has been decided to practically erect a new building. On the north side of the present building (which consists of nave and transepts, with galleries and small apse) it is proposed to erect a lofty nave, chancel, and north aisle, with clearstories and arcades. The nave of the present church will become a south aisle, and the present chancel a choir aisle. The vestries will be on the north side of the new chancel. The organ-chamber will be over the clergy vestry. The south wall will be taken down to about half its present height, and what remains will be cased with the same material as the new work, windows will be inserted and a clearstory introduced to the south aisle. Eventually the tower and spire will be cased with stone. The galleries will be removed, and the church will afford sitting accommodation on the ground floor for 1,060 persons. The work has been divided into sections, and it has been decided to complete the new nave, with aisle and west porch first, the contract for that portion amounting to 4,565*l*. The second portion includes chancel, north porch, and vestries, and will cost 2,548*l*. 10s. The exterior walls of the church will be of red Alveley stone, and the interior of red and white Ruabon bricks. The architect is Mr. J. A. Chatwin, of Birmingham, and the builder, Mr. T. Collins, of Tewkesbury.

MUNICIPAL BUILDINGS, SALTCOATS, AYRSHIRE.—The new Public Hall and Municipal Buildings at Saltcoats were opened on the 20th ult. The hall has been erected on the site formerly occupied by the old Parish School. The principal entrance is in a large two-story block fronting Countess-street. This block consists of the main corridor and offices on the lower floor and the court-room on the upper floor. An archway gives access to the entrance-hall, and the chief features of the design are the low balustraded tower and large central pedimented gable. The main lobby and staircase are reached by the entrance corridor, which extends along the whole width of the great hall. The public hall has been placed lengthways between the Countess-street block and Green-street, the platform being at the Green-street end and a small gallery at the other. Wide passages extend along the walls at both sides, and exit side doors will be placed both at the platform end and in the main lobby. In the public-hall sitting accommodation is provided on the ground floor for 700 people, exclusive of the platform, while the gallery is capable of holding 150 more. A wide and easy ascent leads to the upper floor, in connexion with which a landing gives access to the gallery on the left, and to the new upper-hall or court-room on the right, and to the old Town-hall. The court-hall has a deeply-coved ceiling, lined dadoes, and there is a small platform to which access can be had from both sides. There are also retiring-rooms, a cloak-room, and lavatories. The public-hall measures 83 ft. by 41 ft., and the court-room 48 ft. 6 in. by 29 ft. Messrs. W. H. Howie and H. D. Walton, Glasgow, are the architects.

SOCIETY OF ARTS.—The first meeting of the one hundred and thirty-ninth session of this Society will be held on Wednesday next, the 16th, when the opening address will be delivered by Sir Richard Webster, Q.C., M.P., Chairman of the Council.

FOREIGN AND COLONIAL.

FRANCE.—It is announced that for reasons of economy the post held by the late M. de Joly in the Chamber of Deputies will not be filled up.——On November 13 the monument erected by subscription to the memory of the painter Feyen-Perrin will be inaugurated in the Montmartre Cemetery. This monument, which has been executed by M. Farge, architect, is ornamented with a bust of the artist, and an allegorical figure, by M. Guilbert, who designed the monument to Etienne Dolet.——The building of the new galleries for the Natural History Museum have just been commenced; they are being built by M. Dutert, along the Rue Buffon. These galleries are to replace the old buildings in the Rue Cuvier, in which are the palæontological and anthropological collections.——M. Jules Guiffray, professor at the École des Chartes, is shortly going to publish the catalogue of the Museum of National Archives, which is very rich in ancient and curious documents.——The Pont de Conflans, between Charenton and Ivry, has just been inaugurated; we now hear of the laying of the first stone of the new bridge which is to connect the Commune of Bonneuil to that of St. Maux les Fosses. This bridge, which crosses the Marne, will consist of stone piers, connected by a metal floor. It will be inaugurated next August.——The Bibliothèque Nationale has just been enriched by a manuscript of Jean Goujou, containing six chapters of a treatise on architecture.——In a few days a new hospital for old people will be opened at Rueil (Seine-et-Oise). It has been paid for by the Municipality of that town.——The Society of the Amis des Arts de Pau will open their their twenty-ninth annual exhibition from January 15 to March 15, 1893.—The jury on the competition for rebuilding an Établissement des Bains at Biarritz has just given its judgment. The first prize was awarded to M. Felix Calinaud, architect, Paris, who is to execute the commission. The second prize has been given to M. Henri Nodel, also a Paris architect, and the third to M. Raymond Métivier, architect of the Département du Gers.——Several important works are shortly to be commenced in the town of Toulouse. Amongst the number we may mention a large theatre, a bridge over the Garonne, and two foot-bridges over the Canal du Midi.——The Director of Fine Arts is in communication with the Municipality of Tours with a view of obtaining the transfer of two magnificent pictures by Mantegna to the Louvre. The two pictures, "Christ in the Garden of Olives," and the "Resurrection," were taken at Verona during one of Napoleon's campaigns in 1803. As a compensation, the Director of Fine Arts has offered to the town two pictures, one by Millet and one by Poussin.——The death is announced of M. Alexandre Brisse, in Rome, at the age of 72. He undertook and carried out the drying up of the Lake Fucino; the expenses, which amounted to 30,000,000 francs, were defrayed by the Prince Torlonia.——We regret to hear of the death of M. Marteau, architect of the Département du Nord, at the age of 79. M. Marteau was member of the Société Centrale des Architectes, and always followed with much interest the work of the Annual Congress.——A new bridge, to be called the Pont Mirabeau, is shortly to be made; it will unite the Auteuil and Grenelle quarters of Paris.

BERLIN.—Professor Reinhold Begas has now been commissioned by the Emperor to prepare a new design for the National Monument to the late Emperor William, which is to have its position in front of the Royal Palace. The drawings and models are to be placed before the Imperial Parliament next session.——The Government has granted about 5,000*l*. towards the expenses incurred by painters and sculptors who intend contributing to the German Art Collection which is to be exhibited at Chicago. The contributions will have to pass two juries prior to being accepted by the German Special Commissioners as being representative.——A memorial to the late eminent archæologist, Professor Karl Boetticher, has been erected on his grave in the Dreifeltigkeits churchyard. There was an impressive ceremony in connexion with the official act of placing it into position. Many pupils, friends, and admirers of the savant were present. As in the case of Schinkel's memorial, the design of the monument has been selected from a series of original sketches made by the deceased.——There is apparently now to be an official investigation into the qualities of the various systems of "fire-proof" construction used in Prussia, and more especially a thorough examination of the value of combinations of iron and concrete. A special commission of three is to take the matter in hand, and its work will be greatly facilitated by the powers given to its members. The three members will be (1) an eminent engineer of the Government Board of Works, (2) the principal of the great Testing Station at Charlottenburg, and (3) the chief officer of the Berlin Fire Brigade.——Rapid progress is being made with the reconstruction of the antiquated wooden bridges over the river Spree. There are only three of these ancient structures left, and two of these are soon to be taken down.——A rather sensational case is at present interesting German architectural circles. It has been discovered that a so-called "agent" exists who pretends that, through his influence, he can help architects to win competitioas opened in out-of-the-way countries, such as the Balkan States or South American Republics. This "agent" apparently also manages to supply his client with copies of the competition regulations prior to their being made public, thus giving him the advantage of having more time than other competitors. The "agent's" fees are moderate, *i.e.*, only 20 per cent. off the premium or commission his client obtains. He is able to give references as to past success. A Munich architect has published a letter written by this "agent" offering his services in the Bucharest Railway Terminus competition lately opened.

MISCELLANEOUS.

LODGE "QUATUOR CORONATI."—On the 8th inst. Professor T. Hayter Lewis, Past V.P. R.I.B.A., was installed as Master of the "Quatuor Coronati" Lodge of Freemasons. Of this lodge, which was established in 1884, Major-General Sir Charles Warren was the first Master, and Mr. Walter Besant the first and only treasurer. Attached to the lodge is a Correspondence Circle, composed of subscribers to its "Transactions," and numbering between 1,400 and 1,500 members, who are literally and actually scattered over the face of the globe. Papers are read at all the meetings, and the publication of ancient Masonic MSS. is being steadily proceeded with. For full membership a literary or artistic qualification is essential.

PROPERTIES FOR SALE.—At the Mart, on Monday next, the two large houses, known as "The Elms" and "Coombe Hill House," with their grounds, having frontages to Park-lane, Upper Coombe-street (formerly Coombe-lane), and High-street, together with two adjacent tenements, covering seven acres in all, at the south-end of the town. The former was occupied by the late Sir Thomas R. Edridge; the latter,—a much older residence,—by the late Baron A. Heath, Consul-General for Italy. On the 25th inst., the Strand Theatre, a freehold site of 7,845 ft. superficial, let, together with the house in front, on lease at 1,850*l*. per annum, for a term of which twenty-two years are unexpired. The theatre had been originally built for a panoramic exhibition, and was altered into a playhouse about sixty years ago. Also the freehold of No. 14, Old Bond-street, leased at 750*l*. a year to Messrs. H. P. Truefitt & Co.; with the freeholds of Nos. 8, 9, and 10, Dover-street, and of Nos. 46-7, with the York Hotel, in Albemarle-street. The hotel stands on a site of 6,372 square feet, and is let on lease until March, 1904, at 1,500*l*. per annum. The Albany, Piccadilly, of which five "sets" of chambers were appointed for sale last Tuesday, was designed,—that is to say, the central block,—by Sir William Chambers, and purchased by Viscount Melbourne of Lord Holland, in 1770. It was afterwards occupied by the Duke of York and Albany. The courtyard and buildings cover the sites of the houses of Lord Sunderland, Sir John Clarges, and Lady Stanhope, of which the gardens extended northwards, to what was Vigo-lane.

ADJUSTABLE WOOD CHIMNEY-PIECES.—Mr. John Parker of Birmingham, sends us a sheet of drawings of "adjustable wood chimney-pieces," the special feature of which is that the lintel forming the frieze is made with a decorative treatment in the centre only, the ends being left plain and made or cut in various lengths to suit various sized openings. The shelf is made with sliding dovetails to fix into slots on the top of the jambs, at whatever distance apart they are placed. It will be a convenience and saving to builders choosing chimney-pieces out of stock, though it cannot be said to promote artistic design in such things.

THE SOCIETY OF ENGINEERS.—At a meeting of the Society of Engineers, held at the Town Hall, Westminster, on Monday evening last, Mr. Joseph William Wilson, jun., President, in the chair, a paper was read by Mr. W. H. Holttum, on "The use of Steel Needles in Driving a Tunnel at King's Cross." The author alluded to the advantages derived in working the traffic to and from the London terminus of the Great Northern Railway, in consequence of the execution of an additional tunnel, with approaches, opened this year for goods and passenger traffic. The new tunnel is on the western side of the two older tunnels, the first of which was built in 1850. In length each is 527¾ yards, the inverts throughout resting on the solid blue clay of the "London Clay" formation. The two newer tunnels have a clear width of 26 ft., or 1 ft. more than the original central tunnel. Similar conditions obtain for the three tunnels, and they pass, in a northerly direction, level beneath the Regent's Canal, which is supported upon cast-iron crown plates carrying the clay puddled bed of the canal; thence the rail gradients rise 1 in 371 and 1 in 75 up to the north faces. In the recently completed tunnel an opportunity presented itself for the introduction of a novel method (described and illustrated in the *Builder* for October 3, 1891, p. 256) for working out the excavation beneath steel bars, or needles having a thickness of only 2 in. in place of the ordinary timbering, which generally requires 18 in. excess of excavation around the extrados in order to build the arch of

COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITION.

Nature of Work.	By whom Advertised.	Premium.	Designs to be delivered.
*Municipal Buildings	St. Pancras Vestry	100, 50, & 25 guineas	Jan. 2'93

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Public Baths and Library	Dewsbury Corp.	G. E. T. Laurence	Nov. 15
Cast and Wrought Iron	do.	do.	do.
Re-seating (Oak) Parish Church, Broadclyst	.....	E. H. Harbottle	do.
Gasholder, Newton-le-Willows	Newton-in-Makerfield Imp. Commrs.	R. Brierley	do.
Ironwork	India Office	*Official*	do.
Bar and Sheet Iron, Ostend	Belgian Government	do.	Nov. 16
*Alterations to Wards at Infirmary	Hackney Union	do.	do.
Baptist Chapel, Pengelly	.....	Lash & Gant	do.
Laying Water Mains, &c. (14,000 yards)	Clitheroe Corp.	A. E. Preston	do.
Laying Cast-iron Water Mains, (19,000 yards)	Clitheroe U.R.S.A.	do.	do.
Weaving Shed and Wool Warehouse, Great Horton	Harris Court Mills	John Drake	do.
Granite Road Metal (375 tons)	Shirley & Freemantle Local Board	H. J. Weston	do.
*Sewerage Works	Vestry of St. Marcaret & St. John, Westmstr	G. R. W. Wheeler	do.
Two Model Lodging-houses, Huddersfield	.....	Brooke & Dransfield	Nov. 17
Alterations, &c. to Buildings, Charles-street	Cardiff Corporation	*Official*	do.
Street Works, Sewers, &c. Newport, Mon.	Workmen's Cottage Co. Lim.	.....	do.
Covered Reservoir (4,000,000 gallons)	Swindon Waterworks Co. Lim.	J. R. Shopland	do.
Roadmaking, Ermington and Keaton	Highway Authorities	Elliott, Ellis, & Holcombe	do.
*Shed for Engines, Leicester; Goods Sheds, West Kensington; Coal Offices, Birmingham, &c. &c.	Midland Railway	*Official*	do.
*Supply of Granite Kerb	Walthamstow Loc. Bd.	do.	do.
*Constructing Sewers	Leicester Corp.	do.	do.
Ironwork, The Hague	Dutch Navigation Ministry	do.	Nov. 18
Cast-iron Water Mains	Thornbury R.F.A.	F. J. Williams	do.
Greenheart Timber	Stornoway Pier and Harbour Commrs.	A. Macdonald	do.
Boiler Setting, &c.	Coventry Corp.	E. J. Furnell	Nov. 19
Ironwork	Tyne Impt. Commrs.	*Official*	do.
Kerbing, Channelling, &c. Haydon-bridge	County Authorities	do.	do.
*Laying Iron Water Mains, &c. &c.	Buckingham Corp.	Baldwin Latham	do.
Granary, Penzance	Bodilly & Co.	.....	do.
Fencing, Lossiemouth, N.B.	Elgin Town Council	D. Mackintosh	do.
*Alterations to Schools	Aldershot School Bd.	S. Stapley	Nov. 21
Iron Roof Columns	Bury Corporation	W. H. S. Gendall	do.
Wrought-iron Fencing, Friar-park	West Bromwich Corp.	J. T. Eayrs	do.
*Straight and Circular Edge Kerb	Bermondsey Vestry	*Official*	do.
Dwelling-house and Office, Hopeman, Elgin, N.B.	Parochial Board	C. C. Doig	do.
Additions, &c. to Inn, Oakwood, Carnarvon	Vale of Neath Brewery	.....	do.
Sewerage Works (21 miles of Earthenware Pipes, &c.)	Houghton-le-Spring U.R.S.A.	D. Balfour	do.
Storage Reservoir, Filter Beds, &c. Hollin Ball	Hebden Bridge Dist. Local Board	*Official*	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Additions to Lodging-house, Portugal-street	Glasgow Impt. Trust.	*Official*	Nov. 21
Railway Construction, Strakonit to Winterberg	Austrian State Rys.	do.	Nov. 22
*Pulling down a portion of School Buildings, &c.	St. Olave's Grammar School Governors	do.	do.
Sewerage Works, Flixton	Barton-upon-Irwell U.R.S.A.	Mr. Hooley	do.
*Making-up Roads	Fulham Vestry	W. Sykes	Nov. 23
*Additions, &c. to Priory Board Schools	Acton School Board	E. Monson, Jun.	Nov. 24
*Making-up and Paving Streets	Walthamstow Loc. Bd.	G. W. Holmes	Nov. 25
Additions, &c. to Workhouse	Newcastle-upon-Tyne Union	W. H. Dunn	do.
Sewerage Works	Aston U.R.S.A.	Mr. Hawgood	Nov. 26
*Roadmaking Works, Claybury Asylum Estate	London County Council Asylums Committee	G. T. Hine	Nov. 28
Additions to Schools and Master's House	Mynyddislwyn Sch. B.	G. Rosser	do.
*Concrete Steps, Cook's Store, &c. Gore Farm	Met. Asylums Board	A. & C. Harston	do.
*Enlargement of Post Office, Worcester	Com. of H. M. Works	*Official*	do.
Steel and Iron Bridge, Hogg's Mill River	Kingston-upon-Thames Corp.	do.	do.
*Underground Conveniences	Com. of Sewers	do.	Nov. 29
*Removal of House Refuse	Wandsworth B. of W.	do.	do.
*Levelling and Draining Site, Building Lodge and Chapel, &c. &c.	Attleborough Bur. Bd.	do.	do.
School Buildings, Southsea (1,112 children)	Portsmouth Sch. Bd.	Rake & Cogswell	do.
*New Board Room and Offices	Brighton Guardians	Nunn & Hunt	Dec. 5
Harbour Works, Corunna	Spanish Government	*Officials*	Dec. 15
Harbour Works, Bourgas	Bulgarian Governmt.	do.	Mar. 12'93
*Buildings on Woolwich Common	War Department	do.	No date
Broken Whinstone Road Metal	Walker Local Board	do.	do.
Road Metal	do.	do.	do.
Additions, &c. to Hotel, Princestown, Devon	Mrs. Badcock	.....	do.
Additions to School, Mortomley	Ecclesfield School Bd.	G. A. Wilson	do.
Additions to Presbyterian Schools, Risley, Lancs.	.....	Percy Silcock	do.
Three Oven Kilns, Wheesoe, Darlington	F. T. Atkinson	.....	do.
Infirmary, Halifax	Governors	Worthington & Elgood	do.
Additions to Marine Hotel, South Shields	Tadcaster Brewery Co.	R. F. Simpson	do.
Church, Malone, Belfast	.....	H. Seaver	do.
Buildings, Northumberland-court, Newcastle-on-Tyne	Thos. Cooke	J. T. Cackett	do.
Two Houses, Peterborough	.....	J. G. Stallebrass	do.
Dwelling-house, Wyke, Northumberland	.....	G. C. Ross	do.
Additions, &c. to Dwelling-houses, Houghton-le-Spring	A. Henderson	.....	do.
Iron Tanks, &c.	Guildford Gas Light & Coke Company	Mr. Lloyd	do.
Sluice Valves	Manchester Corp.	T. H. G. Berry	do.
*Making-up Road	.....	Baker & Son	do.
*Fitting Mahogany Cases and other Fittings	Norwich Castle Museum	E. Boardman & Son	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Temporary Sanitary Inspector	Tonbridge Local Bd.	.....	Nov. 17
*Clerk of the Works	Battersea Vestry	3l 10s. per week	Nov. 18
*Assistant Borough Surveyor	Aberdeen Town Coun.	250l.	Nov. 21
*Borough Engineer and Surveyor	Birkenhead Corp.	500l. &c.	Nov. 23
*Inspector of Nuisances	Stroud Local Board	100l.	Nov. 28

Those marked with an Asterisk (*) are advertised in this Number. *Competition*, p. iv. *Contracts*, pp. iv., vi., & viii. *Public Appointments*, p. xx.

the tunnel. The first needles used were those patented by Messrs. Jennings & Stannard. The author described the form and method of driving these needles by means of screw-jacks; also the various contrivances used to fill up the 2 in. annular space left over the tunnel when the forward movement of the needles began, and the plan, ultimately adopted, of running fine cement concrete along chases left at intervals within the outer ring of the tunnel arch, whereby the chase as well as the space behind the advancing needles became filled with an imperishable material, and the subsidence of the surface of ground was reduced to a minimum not worth any serious consideration, although beneath the busy goods yard traffic which uninterruptedly continued during the construction of the tunnel. Reference was made to the use of trussed cills, instead of the usual long rakers, to the upper cills of the face timbering, which had the advantage of leaving the temporary roads of the tunnel less obstructed, as well as having no raker holes in the invert to fill up afterwards. Another introduction, designed by Mr. E. Duncan, to obviate a tendency the needle had, at times, to drop out of place was that of interlocking the needles so as to form an almost solid steel roofing of 2 in. in thickness. These were worked northwards from Nos. 1 and 2 shafts, whilst the earlier needles did duty southwards from Nos. 2 and 3 shafts, in lengths averaging 6 ft. Where underpinned piers interposed within the area of the proposed tunnel and prevented further driving, the steel needles were removed and timber bars were resorted to, and built in as the work proceeded. In conclusion, the author referred to the evident economy of this new method of driving tunnels, or culverts; and he considered that engineers would find, among the various conditions under which tunnelling was to be executed, that this new method has a large sphere of usefulness in effecting both economy and good workmanship. The engineer for the King's Cross tunnel works was Mr. Richard Johnson, M.Inst.C.E., and the contractor was Mr. Henry Lovatt.

ARTISTS' BENEVOLENT FUND.—The eighty-third anniversary dinner of this Fund is fixed for Saturday, the 26th inst., at "The Criterion," Sir Edward Clarke, Q.C., M.P., in the chair. We may mention here, on the authority of the Committee, that the "Artists' Fund" was established in the year 1810, and received in 1827, from George IV., its patron, a Royal Charter of Incorporation. It now enjoys the gracious patronage and support of the Queen. It consists of two divisions. The first, the Artists' Annuity Fund, is raised and wholly supported by the contributions of its members for their own relief in sickness and old age; it neither asks for nor receives any support from the public. All artists in painting, sculpture, architecture, and engraving are eligible to become members. On the other hand, the second, the Artists' Benevolent Fund, is a purely charitable society, and has for its object exclusively the relief of the widows and orphans of members of the Annuity Fund left in need; it is supported by the donations and subscriptions of the patrons of the fine arts and artists, and annual contributions of the members of the Annuity Fund. These annual sums, payable to the most needy of the widows, and to the orphans, are respectively supplemented by donations and from the interest on benefactions of Miss E. L. Pye and the late Mr. Edward Absolom. The claims of all widows and orphans who become entitled to its benefits are admitted at once, and without limit to their number. During the past year forty-four widows and seventeen orphans received annuities, amounting in the whole to 981*l.* 2s. The annual sum of 20*l.* is paid to each widow, and the annual sum of 6*l.* to each orphan under the age of sixteen. The Committee are anxious to increase these allowances. Since the institution of the society the sum of 55,407*l.* 15s. 5d. has been distributed in relieving widows and orphans of artists, whose circumstances render such assistance necessary. Further information as to the Fund may be had from Mr. L. Young, the secretary, 23, Garrick-street, Covent-garden, W.C.

THE ENGLISH IRON TRADE.—The situation of the English iron market shows little alteration. The falling-off in shipments of iron and steel, as evidenced by the Board of Trade statistics, continues. The increase of 16,914 tons in the stocks of Cleveland pig announced in the monthly returns has caused further quietness in that district, and in few instances in the crude-iron branch is there much activity. The manufactured-iron department continues to exhibit a depressed tone, and in steel little change is to be noted. Tin-plates exhibit a slightly better demand. In shipbuilding and engineering only a moderate number of inquiries are to hand. The coal trade is tolerably steady.—*Iron.*

RECENT PATENTS.—Pressure on our space compels us to hold over until next week our usual list of new patents.

MEETINGS.

SATURDAY, NOVEMBER 12.

Sanitary Inspectors' Association.—Inaugural address by the Chairman, Mr. Hugh Alexander. 6.15 p.m.

MONDAY, NOVEMBER 14.

Surveyors' Institution. — Opening Address of the Session by the President, Mr. Charles J. Shoppee. 8 p.m.

Clerks of Works' Association (Carpenters' Hall).—Paper by Mr. D. M. Nesbit. 8 p.m.

TUESDAY, NOVEMBER 15.

Institution of Civil Engineers. — (1) The Hon. R. C. Parsons, M.A., on "Halifax Graving-Dock, Nova Scotia." (2) Mr. E. W. Young on "Cockatoo Island Graving-Dock, New South Wales." (3) Mr. W. Redfern Kelly on "The Alexandra Graving-Dock Belfast." (4) Mr. Robert Pickwell on "Construction of a Concrete Graving-Dock at Newport, Monmouthshire." 8 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. F. J. Sykes on "Objects and Methods of Inspection." 8 p.m.

Glasgow Archæological Society. — Annual Meeting. Sir John Evans on "The Coins of the Ancient Britons."

Glasgow Architectural Association.—Mr. W. Forrest Salmon on "Michelangelo: His Life and Works." 8 p.m.

WEDNESDAY, NOVEMBER 16.

Society of Arts.—Opening Address of the Session by Sir Richard E. Webster, Q.C., M.P. 8 p.m.

British Archæological Association.—(1) Mr. J. Romilly Allen on "Early Christian Monuments of Glamorgan." (2) Paper by Mr. A. C. Fryer, entitled "Notes of Recent Discoveries." 8 p.m.

Royal Meteorological Society. — (1) Paper by Mr. J. Lovel; (2) Mr. W. H. Dines, B.A., on "The Measurement of the Maximum Wind Pressure, and Description of a New Instrument for Indicating and Recording the Maximum." 7 p.m.

Builders' Foremen and Clerks of Works' Institution.—Ordinary meeting. 8.30 p.m.

FRIDAY, NOVEMBER 18.

Architectural Association.—Mr. Paul Waterhouse on "Some Mysteries of Modern Architecture." 7 30 p.m.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. F. J. Sykes on "Nature of Nuisances, including Nuisances the Abatement of which is Difficult." 8 p.m.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

OCTOBER 29.—By *A. Savill & Son* (at Southend): Three f. cottages, Great Wakering, Essex, and 2a. 0r. 18p., r. 16*l.* 200*l.*; f. cottage and blacksmith's shop, r. 20*l.*, 260*l.*; four f. cottages, r. 34*l.* 10s. 645*l.*; an enclosure of f. land, 11a. 2r. 38p., r. 12*l.*, 215*l.*; six f. cottages, North-st., Rochford, r. 42*l.* 16s., 710*l.*; two cottages, Prittlewell, r. 22*l.*, 420*l.*; enclosure of f. land, near Southend, 8a. 2r. 24p., r. 18*l.*, 1,400*l.*; two f. cottages, Laindon Hills, r. 14*l.*, 240*l.*

OCTOBER 31.—By *G. B. Hilliard & Son*: "Fairland's Farm," near Ongar, and 221a. 3r. 30p., f., 1,825*l.*—By

Baxter, Payne, & Lepper: The f. residence, "Loseberry," near Claremont, and 32a. 0r. 20p., 5,000*l.*; an enclosure of land, 11a. 0r. 11p., 1,300*l.*; ditto arable land, 5a. 1r. 10p., 650*l.*—By *Ball, Norris, & Hadley*: 27 to 37 (odd), Canterbury-rd., Croydon, f., r. 177*l.*, 2,100*l.*; 11 and 13, Commercial-rd., Peckham, f., r. 60*l.*, 830*l.*; 21 and 23, Great Barlow-st., Marylebone, u.t. 34 yrs. g.r. 36*l.*, 630*l*; 20, Hilton-ter., Fulham-rd., u.t. 88 yrs g.r. 15*l.*, 665*l.*; 41 and 43, Thurlow-hill, Tulse Hill, u.t. 83 yrs., g.r. 12*l.*, r. 38*l.*, 300*l.*—By *H. J. Bromley*: 23, Stanstead-rd., Forest Hill, u.t. 84 yrs., g.r. 6*l.*, r. 33*l.*, 450*l.*—By *J. Dawe*: The lease and goodwill of 3, Bishop's-rd., Paddington, u.t. 18 yrs., r. 200*l.*, 300*l.*—By *Westmore & Young*: 30 and 32, Palace-rd., Norwood, f., r. 58*l.*, 640*l.*—By *E. E. Croucher & Co.*: "Malvern Lodge," Torrington-pk., Finchley, u.t. 32 yrs., g.r. 28*l.*, 350*l.*

NOVEMBER 1.—By *Field & Sons*: F. residence, Market-pl., Romford, r. 26*l.*, 365*l.*; F.g.r. of 27*l.*, Industry-ter., Poplar, reversion in 87 yrs., 545*l.*; 32 to 44 (even), Acton-st., Haggerston, u.t. 26 yrs., g.r. 21*l.*, 1,040*l.*; 42, Thurlow-st., Walworth, u.t. 58 yrs., g.r. 16*l.* 15s., r. 130*l.* 16s., 580*l.*; 1 to 7 (odd), Lilford-rd., Camberwell, u.t. 18 yrs., g.r. 10*l.*, r. 62*l.*; and l.g.r. of 10*l.*, 300*l.*; 7, Fearnley-rd., u.t. 74 yrs., g.r. 8*l.*, r. 52*l.*, 270*l.*, 21, Ladd's-ct., Southwark, f., r. 18*l.* 4s., 110*l.*; 12 and 13, Noah's Ark-alley, f., r. 44*l.* 4s., 370*l.*—By *Debenham, Tewson, & Co.*: 31, 33, and 35, Church-st., Stoke Newington, f., r. 165*l.*, 2,540*l.*; f. residence, Golding's-hill, Loughton, 750*l.*; two f. cottages, Lower-rd., r. 37*l.* 12s., 290*l.*—By *G. F. Francis*: 43, Denman-rd., Peckham, f., r. 33*l.*, 445*l.*—By *Wilkinson, Son, & Welch* (at Brighton): 16, Denmark-villas, Hove, f., 1,330*l.*

NOVEMBER 2.—By *A. Barton*: 233 and 235, Hoxton-st., Hoxton, f., r. 126*l.*, 2,235*l.*; 15 and 17, Brunswick-pl., u.t. 5 yrs., g.r. 51*l.*, 40*l.*—By *D. Smith, Son, & Oakley*: Two plots of f. and c. land, 3a. 1r. 32p., Woking, 1,000*l.*—By *J. H. Hibbard*: 1, 2, 4 to 8, Belgrave-ter., Leyton, f., r. 119*l.*, 1,400*l.*; f.g.r. of 10*l.*, Belgrave-ter., reversion in 78 yrs., 210*l.*; a plot of l. land, Junction-rd., 245*l.*; 35, Orville-rd., Battersea, u.t. [91 yrs., g.r. 7*l.*, 95*l.*; 28, Norman-rd., Bow., f. 320*l.*; 88 and 90, Ford-rd, Old Ford, u.t. 76 yrs., g.r. 11*l.*, 210*l.*; 131 and 133, St. Stephen's-rd., u.t., 76 yrs., g.r. 10*l.*, 205*l.*

NOVEMBER 3.—By *C. C. Taylor & Son*: 18 and 20, Ewing-st., Mile End, u.t. 85 yrs., g.r. 10*l.* 10s, 360*l.*—By *H. C. Newson*: F.g.r. of 60*l.*, Houndsditch, reversion in 39 yrs., 1,660*l.*; f.g.r. of 100*l.*, Church-row, Houndsditch, reversion in 39 yrs., 2,950*l.*; f.g.r. of 30*l.*, Church-row, ditto in 69 yrs., 890*l.*; f.g.r. of 100*l.*, Church-row, reversion in 75 yrs., 2,920*l.*; 20, South Molton-st., Oxford-st., City leasehold, g.r. 6*l.*, r. 120*l.*, 2,470*l.*—By *Messrs. Chadwick*: 188, Walton-st, and 13, Crescent-pl., Brompton, f., area 4,030 ft., 2,100*l.*; 7 and 8, Nag's Head-ct., Drury-lane, f. 265*l.*

NOVEMBER 4.—By *A. J. Sheffield*: 284, Devon's-rd., Bromley, f., r. 28*l.* 12s., 215*l.*; 16 and 18, Ricardo-st., Poplar, u.t. 36 yrs., g.r. 4*l.*, 160*l.*; 45, Locksley-st., Limehouse, u.t. 69 yrs., g.r. 4*l.*, r. 36*l.*, 310*l.*; 132 to 138 (even), Teviot-st., u.t. 72 yrs, g.r. 16*l.*, 895*l.*; 160 to 170 (even), Leven-rd., u.t. 81 yrs., g.r. 22*l.* 10s., 635*l.*—By *Green & Son*: "Clevedon Villa," Perryvale, Forest-hill, u.t. 70 yrs., g.r. 19*l.* 10s., 400*l.*—By *Salter, Rex, & Co.*: 4, Holmes-rd., Kentish Town, u.t. 39 yrs., g.r. 5*l.*, r. 36*l.*, 250*l.*—By *J. A. & W. Tharp*: 51 to 57 (odd), Hamilton-rd., Bethnal Green, u.t. 53 yrs., g.r. 14*l.*, 720*l.*; 5, Ferndale Villas, Leytonstone, u.t. 85 yrs., g.r. 4*l.*, r. 26*l.*, 260*l.*—By *J. Nicholson & Son*: 99 and 101, St. John's-rd., Hoxton, u.t. 15 yrs., g.r. 8*l.*, r. 65*l.*, 350*l.*; 6 and 8, Witchampton-st., u.t. 15 yrs., g.r. 6*l.* 10s., r. 51*l.*, 285*l.*; 25, Hemsworth-st., u.t. 16 yrs., g.r. 4*l.*, r. 25*l.*, [145*l.*; 12 and 14, St. Jude-st., Kingsland, and ground rents, 15*l.*, u.t. 49 yrs, g.r. 13*l.*, 510*l.*

[*Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g r. for ground-rent; r. for rent f. for freehold; c. for copyhold: l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.]

PRICES CURRENT OF MATERIALS.

TIMBER.		
Greenheart, B.G.	ton	9/0 0 / 0/0 0
Teak, E.I.	load	9/10/0 / 15/0 0
Sequoia, U.S.ft.cu.		2/4 / 3/0
Ash, Canada	load	2/10/0 / 4/0/0
Birch, do.		2/5/0 / 4/10/0
Elm, do.		3/10 0 / 4/15/0
Fir, Dantzic, &c.		1/10/0 / 3/10/0
Oak, do.		3/0/0 / 5/5/0
Canada		5/10/0 / 7/0/0
Pine, Canada red		2/10/0 / 3/10/0
Do, yellow		2/10/0 / 5/0/0
Lath, D'ntzic, fath		5/0 0 / 6/0/0
St. Petersburg		5 0 0 / 7/0 0
Deals, Finland		
2nd & 1st std	100	7/10,0 / 9/10,0
Do, 4th & 3rd		7/0/0 / 8/0/0
Do. Riga		6/10 0 / 8/0/0
St. Petersburg, 1st yellow		10/10,0 / 14/10/0
Do. 2nd yellow		8/0/0 / 9/10/0
Do. white		7/0/0 / 9/10/0
Swedish		7/0/0 / 16/0/0
White Sea		8/0/0 / 17/0/0
Canada, Pine 1st		20/0/0 / 26/10/0
Do. do. 2nd		14/10/0 / 16/0/0
Do. do. 3rd, &c.		7/10/0 / 10/0/0
Do. Spruce. 1st		8/10/0 / 11/0/0
Do. do. 3rd & 2nd		6/5,0 / 8/0/0
New Brunswick		6/10,0 / 7/0/0
Battens, all kinds		2/10/0 / 15 10 0
Flooring Boards, sq., 1 in. prep. 1st		0/8/0 / 0/13,0
Do. 2nd		0/7/0 / 0/10/0
Other qualities		0/3 0 / 0 7/6
Cedar, Cuba	..ft.	/3½ / /4½
Honduras, &c.		/3½ / /4
Mahogany, Cuba.		/4½ / /6½
St. Domingo, cargo av		/4 / 2/0
Mexican do. do		/4 / /5
Tobasco do. do		/5 / /7
Honduras do..		/5 / /6½
Box, Turkey	ton	4/0/0 / 13/0/0
Rose, Rio		10/0,0 / 20/0/0
Bahia		9 0,0 / 18/0/0
Satin, St. Domingo	..ft.	0/0 7 / 0/1/3
orto Rico	....	0/0/7 / 0/1/6

TIMBER (*continued*).		
Walnut, Italian	..	0 0 3½ / 0'0/7

METALS.		
IRON—Pig, in Scotland	ton	2/1/3½ / 0/9/0
Bar, Welsh, in London		5/17/6 / 6/0/0
Do. do. at works in Wales		5/7/6 / 5/10/0
Do. Staffordshire, in London		6 5/0 / 6/15,0
COPPER—British, cake and ingot		49 0 0 / 0/0,0
Best selected	..	50 0/0 / 0/0/0
Sheets, strong	..	58/0/0 / 0/0,0
Chili, bars	....	45/10/0 / 45/17/6
YELLOW METALS,		0/0 5 / 0 0 5½
LEAD—Pig, Spanish	....ton	10 2 6 / 10/3 9
English, com. brands		10 5 0 / 10/7/6
Sheet, English, 3 lbs. per sq. ft. and upwards	..	11 10/0 / 0 0 0
Pipe	.....	12/0/0 / 0/0,0
ZINC—English sheet	.....ton	22 15 0 / 0/0,0
Vieille Montagne	.....	23 5/0 / 0 0,0
TIN—Straits	....	94 17/6 / 95 7/6
Australian	....	95/7/6 / 95 17/6
English Ingots.		97/10 0 / 98/0 0
Banca	.....	95/0/0 / 95/5/0
Billiton	.....	94/10/0 / 95/15/0

OILS.		
Linseed	.....ton	18 2 6 / 0,0,0
Cocoanut, Cochin		25/5 0 / 0,0/0
Do. Ceylon	.....	24/0/0 / 0 0 0
Palm, Lagos	....	24 10/0 / 0/0 0
Rapeseed, English pale	.....	25 5 0 / 0 0/0
Do. brown	.....	23 5 0 / 0/0,0
Cottonseed ref	....	18/0,0 / 0/0 0
Oleine	.....	20/10/0 / 21/0/0
Lubricating, U.S.		4/0/0 / 5/0/0
Do. refined	.....	5/10/0 / 12/0/0
TAR—Stockholm	barrel	0/17 6 / 0/18/6
Archangel	....	0/12/6 / 0/0/0

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 12 *noon on Thursdays.*]

BOURNEMOUTH.—For erecting house, stables, lodge, &c., at Canford Cliffs, Bournemouth, for Colonel C. Mercier. Mr. Reginald G. Pinder, architect, Arcade Chambers, Bournemouth:—

W. Hoare	£5,131 1 8	Hayward, Penton, & Hayward	£4,152 3 7
George & Harding	4,625 0 0	E. Buckingham & Son	3,992 17 0
Hammerton & White	4,465 10 2		

BOURNEMOUTH.—For erecting schools, Malmesbury Park, Bournemouth, for the Bournemouth and District School Extension Committee. Mr. Reginald G. Pinder, architect, Arcade Chambers, Bournemouth:—

Kitcher Bros	£2,825 0	W. Hoare	£1,948 10
Hayward, Penton, & Hayward	2,335 0	George & Harding, Bournemouth*	1,911 0
Abley & Cowley	2,224 0	* Accepted.	

BOURNEMOUTH.—For erecting schools, Gladstone-road, Boscombe, Bournemouth, for the Bournemouth and District School Extension Committee. Mr. Reginald G. Pinder, architect, Arcade-chambers, Bournemouth:—

Hayward, Penton, & Hayward	£2,139	George & Harding	£1,997
Kitcher Bros.	2,031	Jenkins & Son	1,794
		W. Hoare, (accepted)	1,535

[All of Bournemouth.]

BRIGHTON.—For the reconstruction of the Grand Concert Hall, West-street, Brighton, for Mr. Mellison. Mr. Alfred Carden, architect, Ship-srteet Chambers, Brighton:—

Wright	£4,690	Longley	£4,160
Cheesman	4,230	Taylor (accepted)	4,000

BRIGHTON.—For the erection of a house, Victoria-road, Brighton, for Mr Woolner. Mr. Alfred Carden, architect, Ship-street, Chambers, Brighton:—

Saunders	£2,680 0	Prince	£2,495 0
Lockyer	2,654 0	Barnes	2,386 0
Botting	2,588 10	Taylor	2,300 0
Parsons	2,549 0	Taverner	2,100 0

BRIGHTON.—For alterations and additions to No. 117, Western-road, Brighton, for Mr. Armstrong. Mr. Alfred Carden, architect, Ship-street Chambers, Brighton:—

Kemp	£959 0	Barnes	£817 0
Chappell	961 0	Taylor	814 0
Cheesman	895 0	Linford	803 10
Patching	868 0	Botting (accepted)	778 0

BRIGHTON.—For erecting a house on Tivoli Estate, Brighton, for Mr. Mould. Mr. Alfred Carden, architect, Ship-street Chambers, Brighton:—

Hunt	£650	Norman*	£497
Taverner	550	* Accepted.	

BUSHEY.—For the carrying out of sewage outfall and disposal works, for the Watford Union Rural Sanitary Authority. Mr. Urban A. Smith, engineer, Victoria-street, S.W.:—

Jas. Dickson	£7,722 4 0	B. Cooke & Co.	£6,447 6 8
Jno. Jackson	7,537 0 0	J. T. Wiegrave	5,749 0 0
J. Neave	7,533 0 0	F. Dupont, Colchester* (accepted)	5,738 6 3
Thos. Turner, Ltd.	6,801 16 4		

* Corrected total.

CHILLERTON (Isle of Wight).—For making a new road at Chillerton, in the parish of Wootton, for the Highway Commissioners. Mr. J. E. Haynes, Surveyor, Carisbrooke-road, Newport, Isle of Wight. Quantities by the Surveyor:—

James Lowe	£375	Charles Harvey	£275
Barton Bros.	370	J. W. Alexander, Shide, Isle of Wight*	250
F. S. Coker	385		
John Linnington	361	* Accepted.	

EGREMONT (Cheshire).—Accepted for making, &c., certain streets (Contracts—Nos. 1, 2, 3, 4, 5, 6, 7, and 8), for the Wallasey Local Board. Mr. A. Salmon, Surveyor, Public Offices, Egremont:—

John McGeoch, Buchanan-road, Seacombe, for No. 1, £142. 12s. 6d.; No. 4, £153. 3s. 2d.; and No. 5, £151. 4s. 5d.

John Bellis, Wallasey-road, Liscard, for No. 2, £41. 11s. 11d.

Thomas Bird, Oakdale, Seacombe, for No. 3, £90. 0s. 8d.

J. W. Wilson, Alexandra-road, New Brighton, for No. 6, £66. 16s. 5d.; No. 7, £54. 1s. 6d.; and No. 8, £26. 3s. 7d.

GLASGOW.—Accepted for the construction of a retaining wall in the River Kelvin, for the Police Commissioners. Messrs. Bell & Miller, engineers, 204, St. Vincent-street, Glasgow:—

Morrison & Mason, Limited, Clyde-place, Glasgow £501 15 6

[Lowest of thirteen tenders, the highest being £798.]

ISLEWORTH.—For drainage and sanitary works at Worton-lane, Isleworth, for Mr. Ruff. Mr. J. Hume, architect, High-road, Chiswick:—

Nowell	£230 7 6	Haywood	£226 10 0
Hopper	228 0 0		

LONDON.—For the erection of new premises in Sloane-square, Chelsea, for Mr. D. H. Davies. Mr. Fred. G. Knight, architect. Quantities by Mr. J. R. Smith:—

First Contract.

W. Shepherd	£13,260	Colls & Sons	£12,330
Lathey Bros.	12,718	B. E. Nightingale	11,838
G. & A. A. Bywaters	12,560	Chas. Wall*	11,550
Stimpson & Co.	12,400	* Accepted.	

LONDON.—For rebuilding and extending the Bedford Institute, Spitalfields, for the Bedford Institute Committee (Society of Friends). Mr. Rutland Saunders, architect, 6, Bishopsgate-street Without, E.C. Quantities by Mr. Walter C. Phillips:—

Ashby Bros.	£7,780	Colls & Son	£7,278
Hall, Beddall, & Co.	7,500	Lawrance & Sons	7,134
Woodward & Co.	7,399	Matlock Bros.	7,133
Prestige & Co.	7,390	Samuel J. Jerrard*	7,069
		* Accepted.	

LONDON.—For alterations and additions to the "Three Tuns" Hotel, Tranquil-vale, Blackheath, S.E., and enlargement of billiard-room in rear, for Mr. Chas. Mead. Mr. Ernest Ludford, architect, 61, Denman-road, Peckham, S.E. Quantities supplied:—

J. & A. Oldman	£1,707 0 0	C. Ansell	£1,461 0 0
F. Tabrum	1,596 2 6	G. Bush	1,420 18 11
E. J. Ford	1,498 7 0		

LONDON.—For the extension of Emmanuel Church, West Dulwich. Mr. Edwin T. Hall, architect:—

W. Marriage (accepted) £1,920 0 0

[No competition.]

LONDON.—Accepted for alterations to the "Mitre Tavern," Fish-street-hill, City, for Mr. H. A. Baxter. Mr. J. Warne, architect, 1, Montpelier-road, Peckham:—

F. H. Hopkins, 102, Crampton-street, Newington Butts, S.E. £495 0 0

LONDON.—For pulling down and rebuilding school-rooms, at "Portland College," Chiswick, for Dr. Baber. Mr. J. Hume architect, Chiswick:—

Barker	£336	Fensom	314
Powell	325		

LONDON.—For removing an iron building from the Glyn-road site, Homerton, and for re-erecting it on the Bailey's lane site, Stamford Hill, for the School Board for London. Mr. T. J. Bailey, Architect:—

W. Harbrow	£312 12	Croggon & Co., Limited*	£187 10
T. Cruwys	225 0		

* Recommended by the Works Committee for acceptance.

LONDON.—For alterations and redecorations to "Belgrave House," Chiswick, for Dr. Baber. Mr. J. Hume, architect, Chiswick:—

Powell	£297 10	C. Rogers	£290 0
Fensom	295 0	J. J. Bryant	279 0
Plumridge & Thomas	290 0		

LONDON.—For erecting a covered playground for the boys' department of the British-street School, Millwall, for the School Board for London. Mr. T. J. Bailey, Architect:—

Gregar & Son	£294	Gibb & Co.	£147
Atherton & Latta	181	W. Neil, Turner's-road, Burdett-road, E.*	74
J. T. Robey	175		

* Recommended by the Works Committee for acceptance.

LONDON.—For additions and redecorations to "Cornwall Lodge," Hammersmith, for Mr. W. Boughton. Mr. J. Hume, architect. Chiswick:—

Chapman & Son	£285 0	Bendon	£219 0
Howlet	240 0	Plumridge & Thomas	212 0
Bryant	238 0	Chapman	202 10

LONDON.—For repairs and redecorations at Bohemia House, Chiswick, for Mr. W. Boughton. Mr. J. Hume, architect, Chiswick:—

Flexman	£262	Nye	£234
Bendon	248	Howlet	230
Plumridge & Thomas	242	J. J. Bryant	228

LONDON.—For drainage and other works at Gardener's-lane, Putney, for Mr. S. B. Jones. Mr. J. Hume, architect, High-road, Chiswick:—

Heywood	£225 10	Fowler	£205 0
Plumridge & Thomas	217 10	Grant	202 0

LONDON.—For providing a cloak-room, &c., for the girls' department of the Fairfield-road School, Bow, for the School Board for London. Mr. T. J. Bailey, Architect:—

Gregar & Son	£194	Gibb & Co.	£127
W. Neil	180	J. T. Robey, Bow-road, E.*	112
Atherton & Latta	157		

* Recommended by the Works Committee for acceptance.

MANCHESTER.—For sewering, paving, flagging, and curbing certain streets on the De Trafford estates, Old Trafford. Mr. John Bowden, C.E., Surveyor, 14, Ridgefield, Manchester:—

C. Braddock	£908 18 0	Matthew, Naylor, & Co.	£707 12 6
Brown, Philips, & Co.	907 8 3	Robt. Lomax, Eccles*	682 19 0
George Clarke	845 0 0		
George Boyson	800 0 0	* Accepted.	

MARGATE.—For the erection of three cottages for Yoakley's Charity. Messrs. Edward Saunders & Son, architects, 6, Bishopsgate-street Without, E.C. Quantities by Mr. Walter C. Phillips:—

Joseph Brown & Son	£809
Paramor & Sons (accepted)	805

MERTHYR TYDFIL.—For the carrying out of sewerage works, Deri, for the Rural Sanitary Authority. Mr. James Jones, surveyor, High-street, Cefncoed, near Merthyr Tydfil:—

Evan Davies	£597 17 2½	William Lewis, New Tredegar, *via* Cardiff*	£453 15 6
John Preece	523 6 8		
Edward Watkins	469 6 6	* Accepted.	

SALE (Cheshire).—Accepted for the alterations and additions to St. Anne's Schools. Mr. John Lowe, architect, Manchester:—

James Smith, Sale £1,450 0 0

SKIPTON.—Accepted for the erection of Millfields Infants School (in connexion with the Skipton Parish Church). Messrs. John Varley & Son, architects, Swadford-street, Skipton. Quantities by architects:—

Masonry—J. F. Robinson, Skipton	£497 18	9
Joiners' Work—Houghton & Leach, Skipton	201 0	0
Plumbing, Glazing, and Painting—David Baldwin, Skipton	90 0	0
Plastering—W. T. & G. Shuttleworth, Skipton	42 10	0
Slating—R. Thornton & Son, Skipton	74 5	0
Iron Flooring and Concrete—Homan & Rodgers, Manchester	119 15	0

[Warming, lighting, and ventilation not let.]

STANLEY (Co. Durham).—For the erection of two shops and eight-roomed house, &c., at Stanley, Co. Durham, for Mr. William Aynsley. Messrs. John Smith & Son, architects, Shotley Bridge, Co. Durham. Excavator, bricklayer and mason, and carpenter and joiner's quantities only by Mr. George Bell, 60, Collingwood-street, Newcastle-upon-Tyne:—

Excavator, Bricklayer, and Mason.

H. Brown & Co.	£1,016 4 11	Wm. Johnson, Flint Hill (accepted)	£736 0 0
Alfred Routledge	790 0 0		

Carpenter and Joiner.

H. Brown & Co.	£845 14 3	T. Mordue, Dipton*	619 10 9
J. T. Heslop	£630 0 0	* Accepted.	

STOCKPORT.—For the laying of sewers and other work, for the Highway and Sewers Committee of the Corporation. Mr. John Atkinson, Borough Surveyor, St. Peter-gate, Stockport:—

Worthington & Pownall	£940 5 0	P. D. & S. D. Hayes	£637 3 0
Brown, Philips, & Co.	790 15 6	Joseph Broadhurst	620 2 10
Allen Taylor	765 9 0	Samuel Ludlow, Stockport*	586 12 4
George Freeman	719 3 5		
		* Accepted.	

STOCKPORT.—For additions and alterations to Technical Schools, for the Town Council. Mr. John Atkinson, Borough Surveyor, St. Peter-gate, Stockport:—

Broadhurst & Mayer	£173	W. H. & H. C. Brown, Stockport (accepted)	£167
Thomas Hoe	169		

STOKE-UPON-TRENT.—Accepted for the erection of a residence for Mr. H. M. Robinson. Mr. John Lowe, architect, Manchester:—

H. & R. Inskip, Longton £2,850 0 0

TAMWORTH.—For the erection of an isolation hospital, administrative buildings, &c., for the Joint Isolation Hospital Board. Mr. Henry J. Clarson, Surveyor, 22, Church-street, Tamworth:—

Watton & Sons	£2,100 0	B. Musson	£1,830 0
Keen & Son	2,049 10	Ed. Williams, Tamworth (accepted)	1,762 0
Clarson & Son	2,013 0		

WALMER (Kent).—For the erection of a house in the Marine-walk. Messrs. Keen & Drake, architects, 41, Bedford-row. Quantities by Mr. C. A. Jaques:—

Paramor & Sons	£3,000	Adcock	£2,743
Lawrance & Sons	2,896	Stiff	2,480
Maides & Harper	2,778	Deane & Son, Deal	2,460

WEST HARTLEPOOL.—For the construction of four roads, and portions of two others, and the laying of a sewer, for the Corporation. Mr. J. W. Brown, C.E., Surveyor, West Hartlepool:—

	Scarbro'-st. Sewer	Richard-st.	Dalton-st.	Back York-rd. and Penz nce-st.	Back Pilgrim and Burbank st.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
W. Robinson	232 10 0	350 4 4	477 0 3	81 11 0	202 1 4
R. J. Avis	—	528 14 8	674 0 0	—	—
C. Lamb, jun., Seaton Carew	—	—	—	*74 10 3	193 9 6
G. Pickering, West Hartlepool	221 5 0	331 13 8	453 18 6	75 9 10	*186 6 8
T. Pybus	—	330 15 0	—	—	202 11 8
Jos. Howe, West Hartlepool	*164 10 10	*309 16 4	*436 9 7	87 15 6	218 12 4

* Accepted.

WALTHAMSTOW.—For making up certain roads for the Local Board. Mr. George W. Holmes, Surveyor, Town Hall, Walthamstow:—

	Westbury-road.	Side-road (N).	Elmsdale-road.	The Crescent.
	£	£	£	£
J. Reeves, Walthamstow*	438	88	285	175
G. Bell	441	87	291	181
Woodham, Fry, & Fry	454	94	286	177
J. E. Bloomfield	475	120	323	209
Thos. Adams	515	89	346	244

* Accepted.

WANSTEAD.—For road-making, &c., Lonsdale and Wellesley roads, for the Local Board. Mr. John T. Bressey, Surveyor, Local Board Offices, Wanstead, N.E.:—

	Lonsdale-road.	Wellesley-road.
J. L. Cattell	£96 0 0	£152 0 0
T. Adams	74 0 0	133 0 0
John Reeves	54 0 0	123 0 0
Wm. Griffiths	56 9 0	119 16 0

WILLINGTON (Durham).—For the erection, &c., of additional schoolrooms, board-room, &c., for the School Board. Mr. William Fox, architect, 8, Hawthorn-terrace, Durham. Quantities by the architect:—

Lister & Son	£1,340 0	W. & R. B'ackett	£1,249 0
Grainger	1,290 0	T. & J. White	1,220 0
Lodge & Sons	1,263 0	Draper & Sons, West Rainton Fence Houses*	1,136 12
Gradon & Son	1,262 15		

* Accepted.

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E. R. T.—J. W. D.—R. C. (Museum of Building and Sanitary Appliances, 19, Maddox-street, W.)—D. and P. (amount should have been sent).—P. and C. (ineligible for insertion owing to non-compliance with our conditions).—F. S. (unintelligible). H. C. B. (shall have attention).—W. H. R.—A. B. J.—W. G. W.—H. A. (no space this week).—A. C. (ditto). Letters on "Some Ancient Wall Paintings," "Bone as a Building Material," "Local Control over Drainage and Sanitary Work," and "Orientation of Churches," are in type, but unavoidably held over this week.—W. & L. (too late).

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

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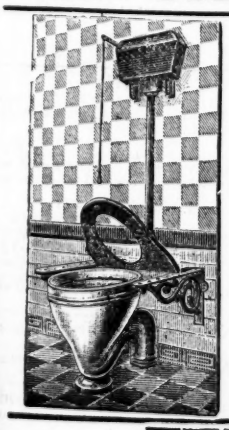

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The WORSHIPFUL COMPANY of CARPENTERS, in conjunction with the Sanitary Institute, will hold the next EXAMINATION at the Carpenters' Hall, on FRIDAY and SATURDAY, DECEMBER 9th and 10th.

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Forms and full particulars can be obtained of the Clerk of the Carpenters' Company, Carpenters' Hall, London-wall, E.C.; or the Secretary of the Sanitary Institute, Margaret-street, W.

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CERTIFICATES in SANITARY SCIENCE for SANITARY INSPECTORS and OTHERS.

The next EXAMINATION in London will be held on FRIDAY and SATURDAY, DECEMBER 2nd and 3rd.

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E. WHITE WALLIS,
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GENTLEMEN PREPARED for the SANITARY INSPECTORS', SURVEYORS', and other EXAMS. of the SAN. INST. or any other SANITARY EXAM. by a SANITARY ENGINEER, Certificated Surveyor, and Inspector by above, first honours Medallist Hygiene, full first honours Plumbing City Guilds, Lond. Upwards 170 recent successes San. Institute exams. Next exam. in Dec. 1892. Tuition by correspondence. For terms, testimonials &c. apply as below. Engineering drawings of every description, with plans, surveys, quantities, and specifications, rapidly prepared. Advertiser can be consulted on all matters connected with Sanitary Engineering.—Address, MKM. SAN. INST. Box 195, Office of "The Builder."

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CITY OF ABERDEEN.

The Town Council of Aberdeen are prepared to receive APPLICATIONS for the APPOINTMENT of ASSISTANT BURGH SURVEYOR.

The salary will be 250*l.* per annum, and the gentleman to be appointed will be required to devote his whole time and attention to the duties of the office, under the direction of the Burgh Surveyor.

Applicants must have a thorough knowledge of the routine of a Burgh Surveyor's Office, and have had practical experience of all the branches of Municipal Engineering, including Water Supply and Sewerage Outfall and Irrigation Works.

Applications, stating age and experience, with testimonials, and endorsed "Assistant Surveyorship," to be lodged with the TOWN-CLERK, on or before MONDAY, the 21st proximo.

W. GORDON,
Town Clerk.

Town House, Aberdeen,
October 22nd, 1892.

COUNTY BOROUGH of BIRKEN-

HEAD.

APPOINTMENT OF BOROUGH ENGINEER OR SURVEYOR.

The Corporation of Birkenhead invite APPLICATIONS for the APPOINTMENT of BOROUGH ENGINEER and SURVEYOR.

The area of the borough is about four thousand acres, and comprises a considerable quantity of building land gradually developing, necessitating the construction of new streets and sewers.

The Corporation own considerable landed property in the borough.

The salary offered is a salary commencing at 500*l.* a year, clear of all office expenses and disbursements.

The person appointed must devote the whole of his time to the duties of the office, and must not engage in private practice. He will, in addition to the duties ordinarily attaching to the position of Borough Engineer and Surveyor, be required to possess a thorough knowledge of the theory and practice of architecture building, land-surveying and valuing, and he will be required to act as Surveyor and Land Agent in respect of the Corporation estate, and to perform such other duties as may from time to time be required of him.

No application from any person exceeding forty-five years of age will be entertained.

The appointment will be made on the understanding that no superannuation or retiring allowance of any kind will be paid to the person appointed.

Applications, in candidate's own handwriting, stating age, experience, and present employment, with copies of not more than five testimonials, sealed, and endorsed "Borough Engineer and Surveyor," must be sent in to me not later than TWELVE o'clock at NOON on WEDNESDAY, the 23rd day of NOVEMBER, 1892.

Canvassing members of the Council will be deemed a disqualification, but Candidates are at liberty, if they choose, to forward to the members of the Council copies of their applications and testimonials.

By order,
ALFRED GILL,
Town Clerk.

Town Hall,
Birkenhead,
October 26th, 1892.

CROYDON UNION.

TO PLUMBERS.

The Guardians require the SERVICES of a practical PLUMBER to act as assistant to, and under the directions of, the Engineer at the Infirmary, Mayday-road, Croydon. Age between 21 and 35. Wages 1*l.* 10s. per week.

Full information as to the duties can be obtained on application to the Engineer at the Infirmary.

A form of application and a printed copy of the duties can be obtained at my Office, or will be forwarded on receipt of a stamped addressed foolscap envelope.

Applications, in the candidate's own handwriting, accompanied by copies of three recent testimonials as to character and competency, must be sent to me on or before MONDAY, the 21st inst.

By order,
HARRY LIST,
Clerk to the Guardians.

Union Offices,
Queen's-road, Croydon,
November 8, 1892.

STROUD LOCAL BOARD of HEALTH.

INSPECTOR OF NUISANCES.

The Stroud Local Board are prepared to receive APPLICATIONS for the APPOINTMENT of a competent person to act as INSPECTOR of NUISANCES, SANITARY INSPECTOR, WATER INSPECTOR, and CANAL BOATS INSPECTOR for the district of Stroud.

The duties will be as defined by the General Orders of the Local Government Board, the Public Health Acts, the Bye-laws of the Local Board, and such other duties as the Board shall from time to time require to be performed.

The salary will be 80*l.* per annum for the office of Inspector of Nuisances, and 20*l.* per annum for the other offices.

It will be a condition of the appointment that the person appointed shall have obtained a certificate of competency in sanitary knowledge from the Sanitary Institute.

Applicants canvassing members of the Board will be disqualified.

No person will be appointed who is over 45 years of age.

The person appointed will be required to devote the whole of his time to the performance of his duties.

The appointment will be made (subject to the approval of the Local Government Board) at a meeting of the Local Board to be held on the 7th day of DECEMBER next, and the duties will commence on the 25th day of DECEMBER next.

Applications, accompanied by not more than three copies of recent testimonials, are to be delivered to me, the undersigned, on or before the 28th day of NOVEMBER instant.

By order of the Local Board,
Stroud, PERCY WITCHELL, Clerk.
November 3rd, 1892.

SEWAGE WORKS MANAGER RE-

QUIRED by the Nuneaton Local Board.

He must thoroughly understand pumping and sludge-pressing machinery, and the treatment of sewage by chemical precipitation and polarite filtration.

Wages, 35s. per week, with house rent-free.

Applications to be sent in on or before MONDAY, NOVEMBER 21st, with copies of three recent testimonials, to J. S. PICKERING, Surveyor, Nuneaton.

THE VESTRY of the PARISH of ST.

MARY, BATTERSEA.

TO CLERKS OF WORKS

The Vestry of the Parish of St. Mary, Battersea, require the SERVICES of a CLERK of WORKS to supervise the execution of repairs to the Chimney Shaft of the Dust Destructor at Culvert-road, belonging to the Vestry, at a salary of 3*l.* 10s. per week.

The work will probably extend over a period of from four to six months. Candidates must have had experience in the construction and supervision of chimney shafts and furnaces.

Forms upon which applications must be made may be obtained at the Vestry Offices, Battersea Rise, and must be returned to the Vestry Clerk marked on the outside "Application for the appointment of Clerk of Works," and accompanied by copies of not more than three testimonials of recent date, by TWELVE o'clock noon on FRIDAY, the 18th NOVEMBER, instant.

Personal canvassing strictly prohibited.

If original testimonials are forwarded the same will NOT be returned.

By order,
CHAS. J. BYWORTH,
Vestry Clerk.

Vestry Offices,
Battersea Rise, S.W.
November 10th, 1892.

TONBRIDGE LOCAL BOARD.

WANTED, — Temporary SANITARY INSPECTOR, one holding Certificate of Sanitary Institute preferred. Duties would include house-to-house inspection (about 2,250 houses).

Engagement would last about 12 to 15 weeks.

Applications, stating previous experience, should reach the undersigned before NOON of the 17th NOVEMBER, 1892, and should be accompanied by at least two recent testimonials, and should state salary expected.

A. H. NEVE, Jr. Solicitor,
Clerk to the Board.

YOUNG MAN (Active and Steady)

WANTED, for Manufacturing Sanitary Engineer's Office. Preference given to one from similar employ, and a good ultimate position ensured to a capable man.—Write fully to Box 270, Office of "The Builder."

IMPROVER WANTED in a first-class

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address and experienced in correspondence, book-keeping, and repairs. — Address full particulars to WHITE, 70, Finsbury-pavement.

CLERK WANTED, in an old-established

Timber Merchant's Office in the country. Must write a good hand, be quick at figures, able to square dimensions, and keep a plain set of books.—Address to Box 266, Office of "The Builder," sending copies of testimonials, salary required, and full particulars.

WANTED, AT ONCE, an active, reliable

CLERK and ASSISTANT, age not to exceed 35. Used to superintending good-class sanitary and general jobbing work. Estimating, prime cost, and accounts. Early riser.—State past experience, age, when at liberty, and salary required, to H. K. EDGE, 199, Belsize-road, Kilburn, N.W.

BUILDER'S CLERK and BOOK-

KEEPER WANTED. Must be well recommended and of strictly sober habits. Good wages.—Apply by letter only, H. KING & SONS, 45, Park-walk, Chelsea.

CLERK (Junior) WANTED, in a City

Builder's Office, hours 8.30 to 5. Shorthand writer.—Address, salary, and previous experience, H. Box 268, Office of "The Builder."

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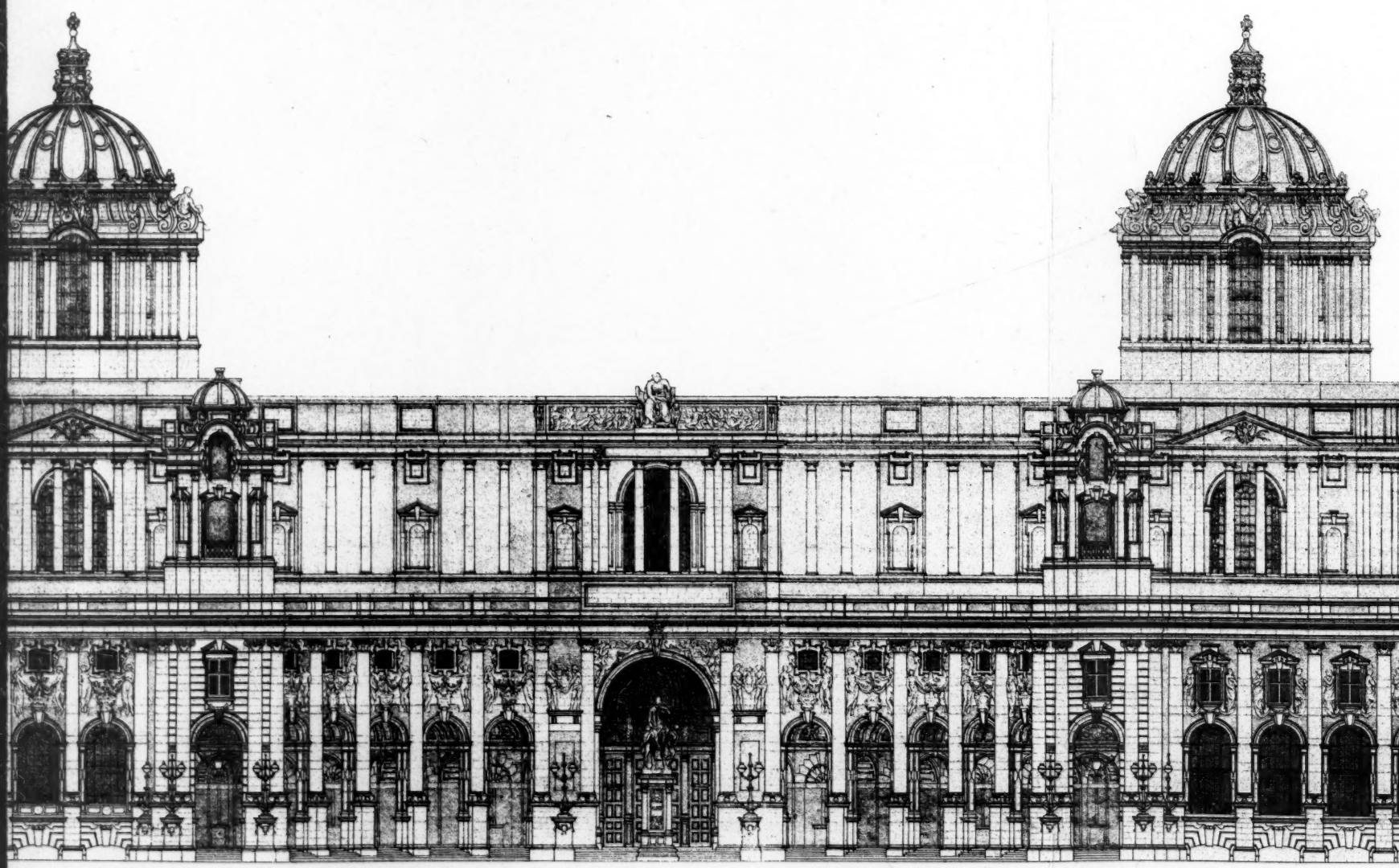

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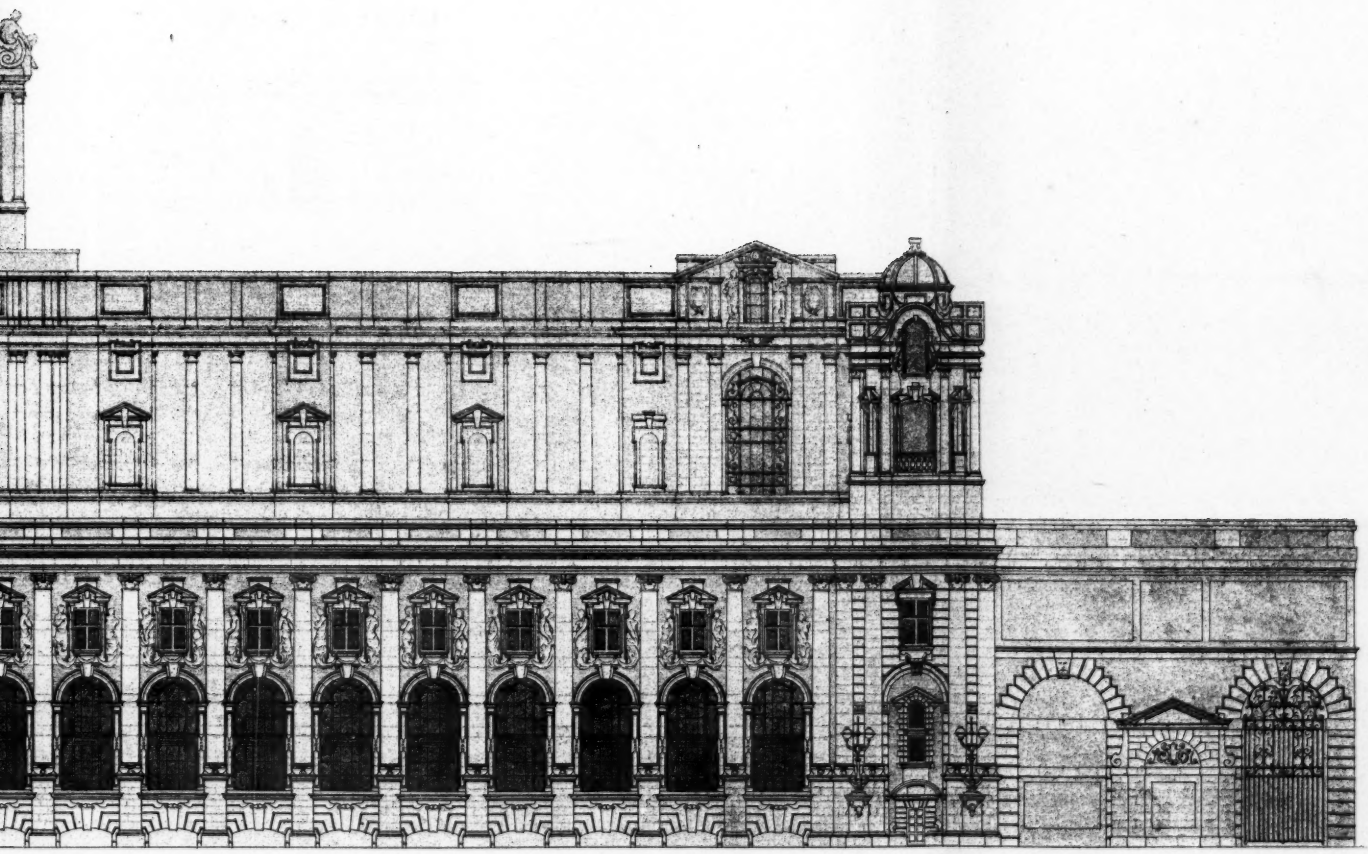

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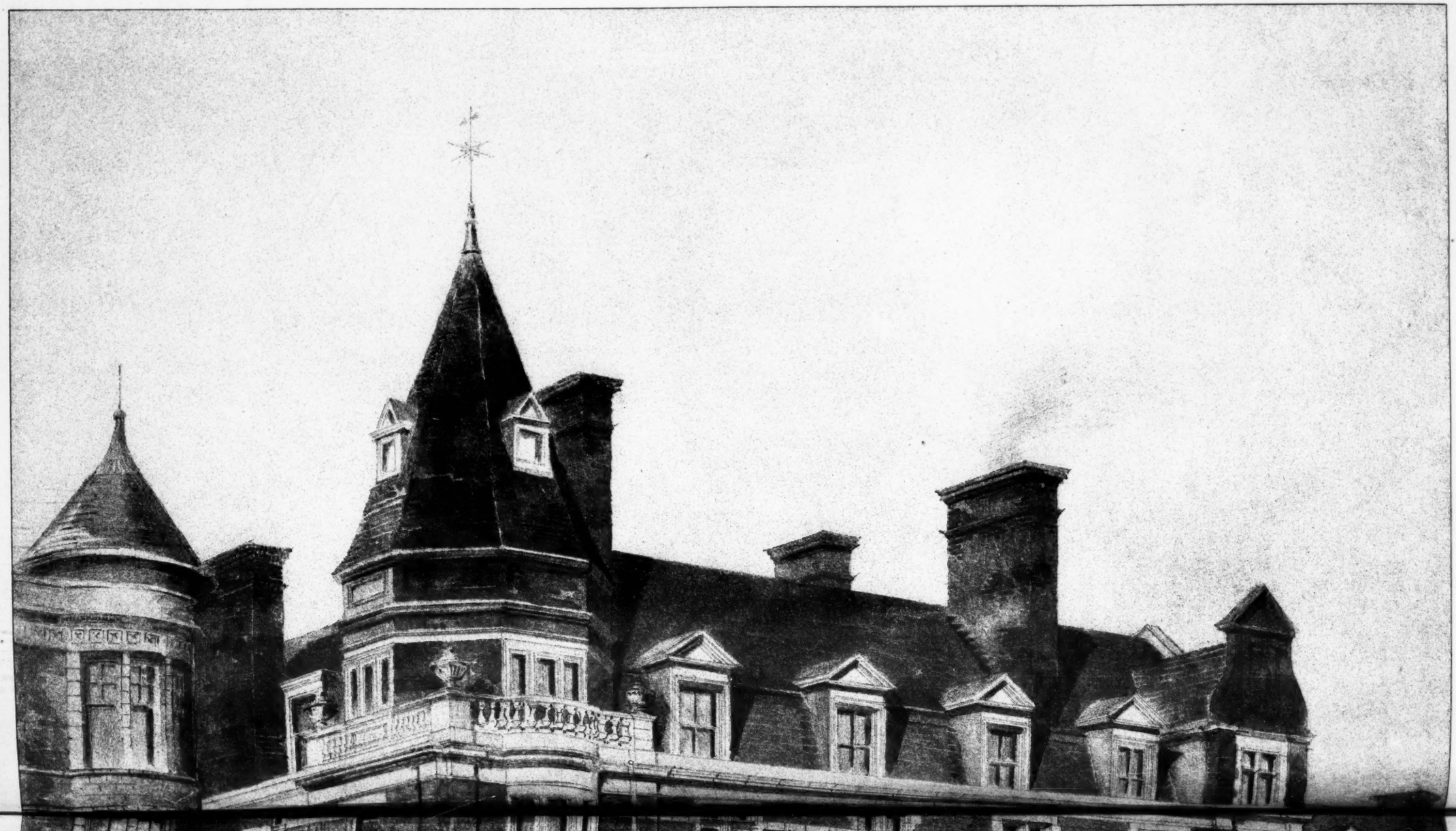

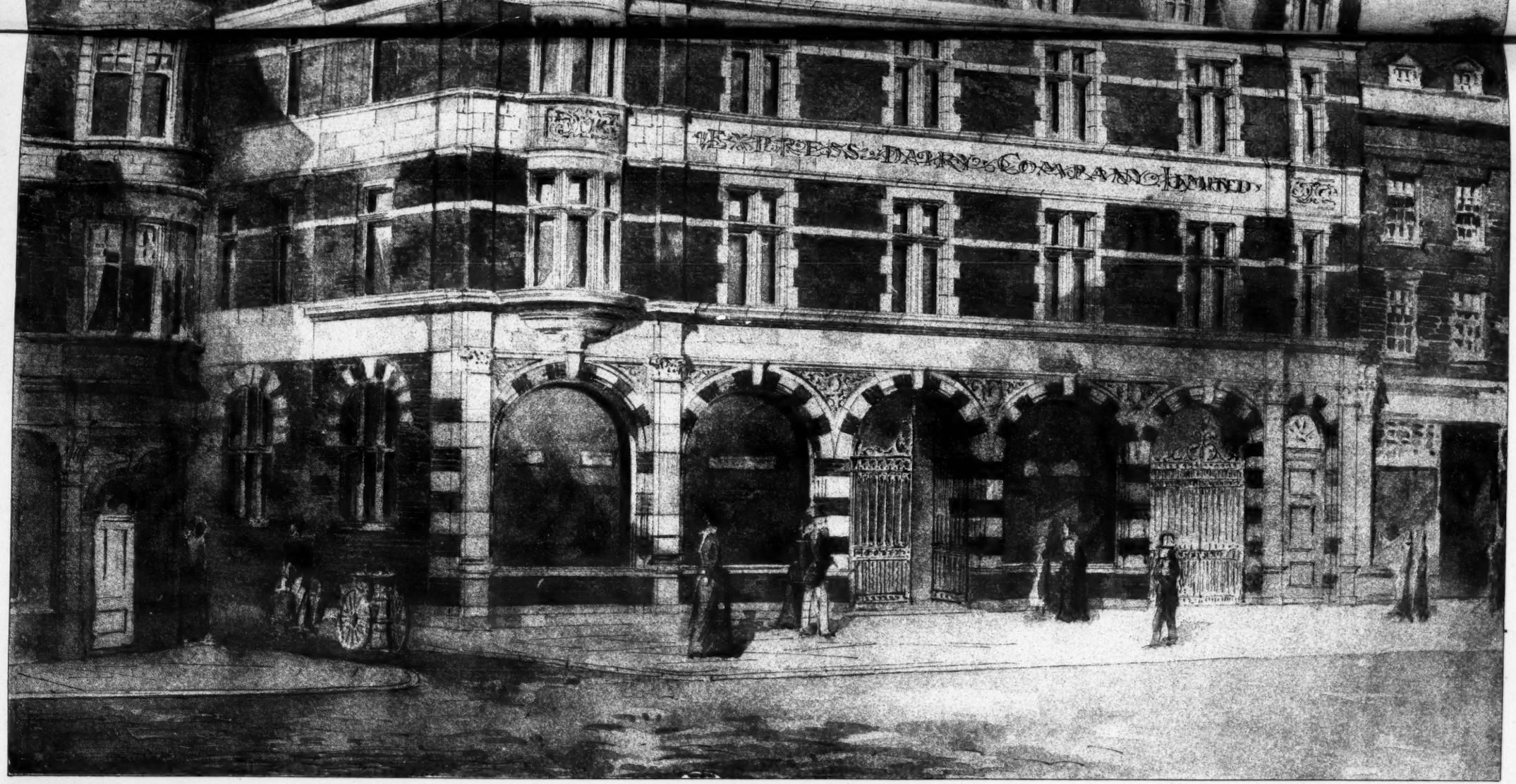

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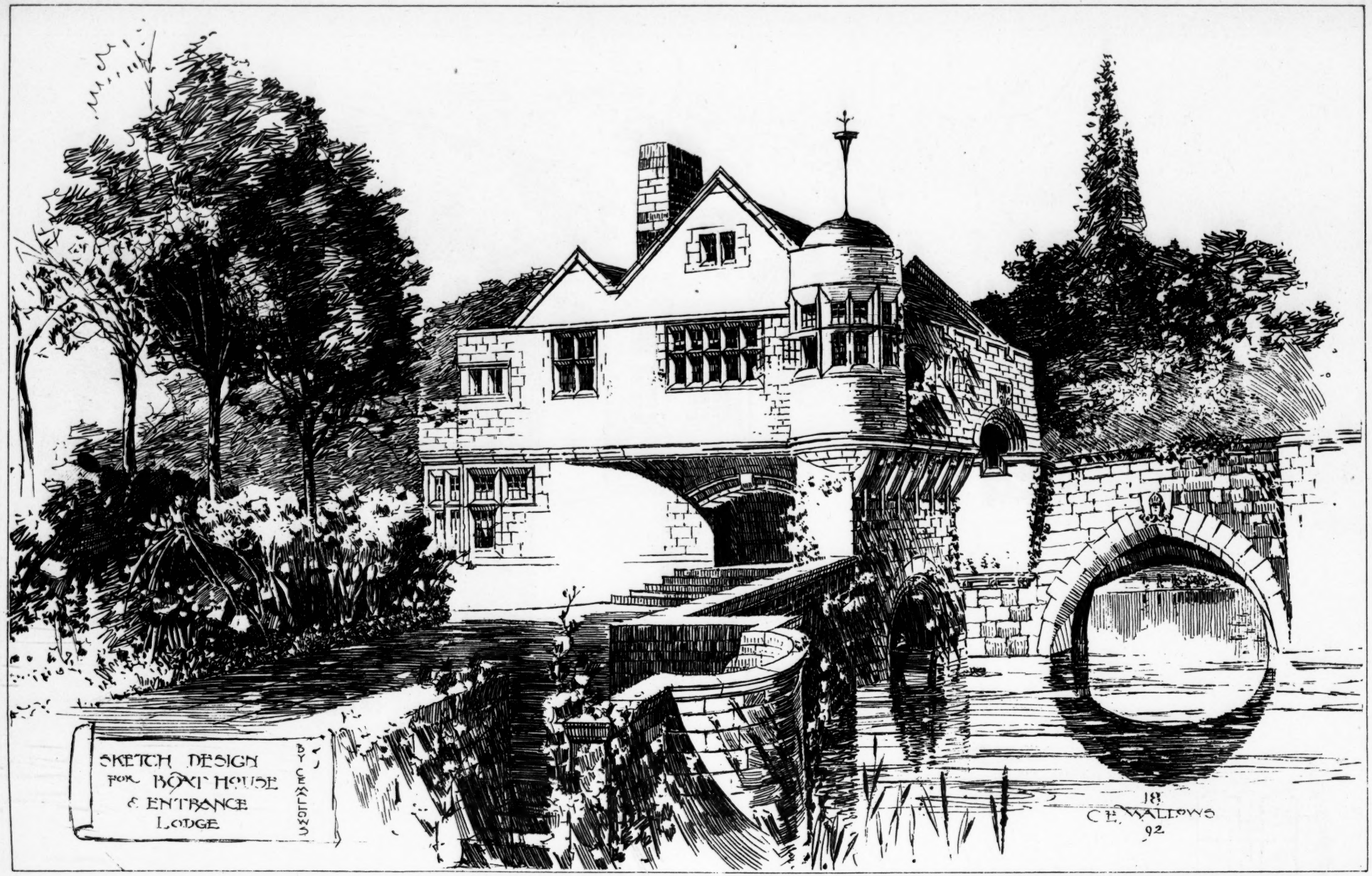

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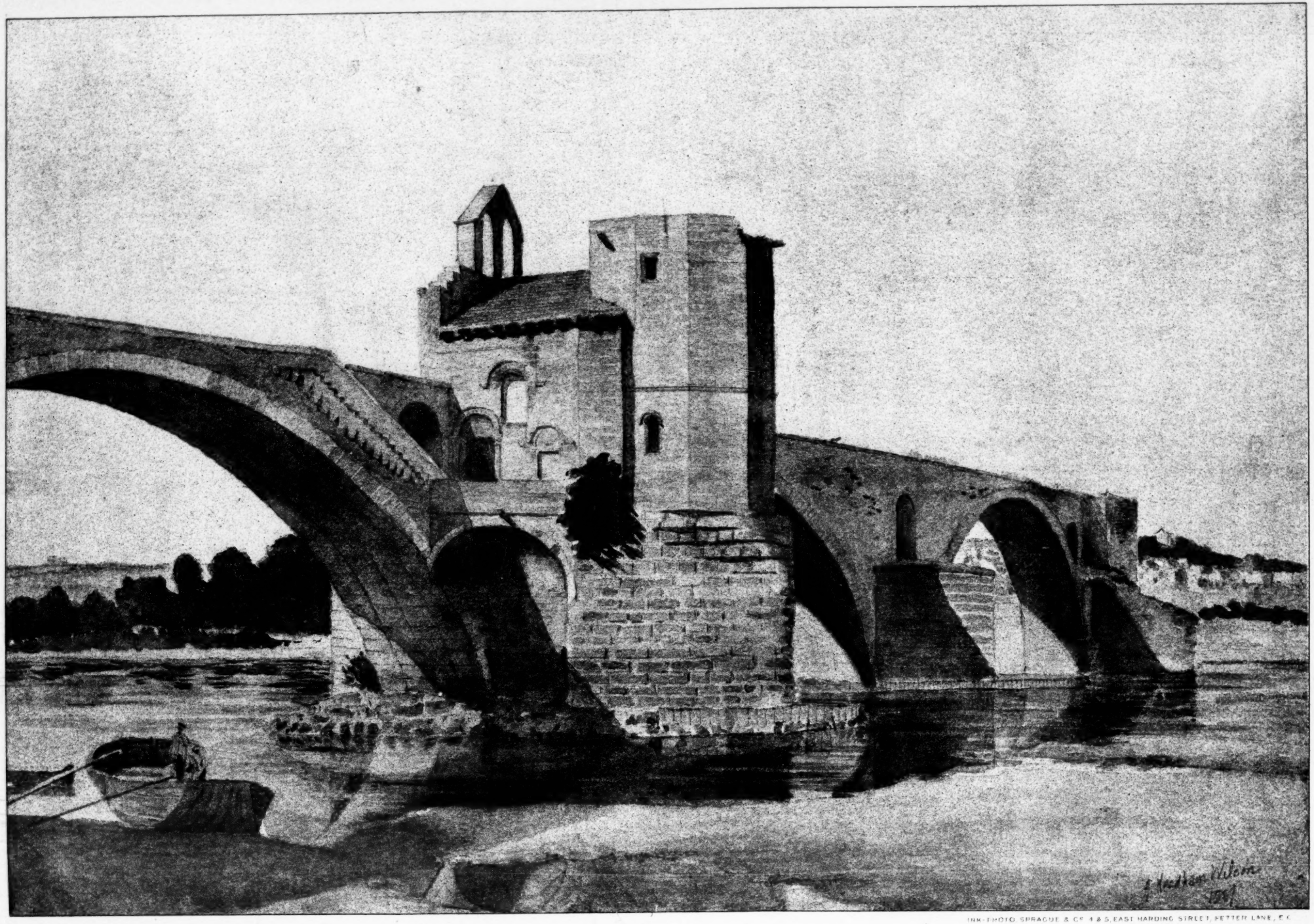

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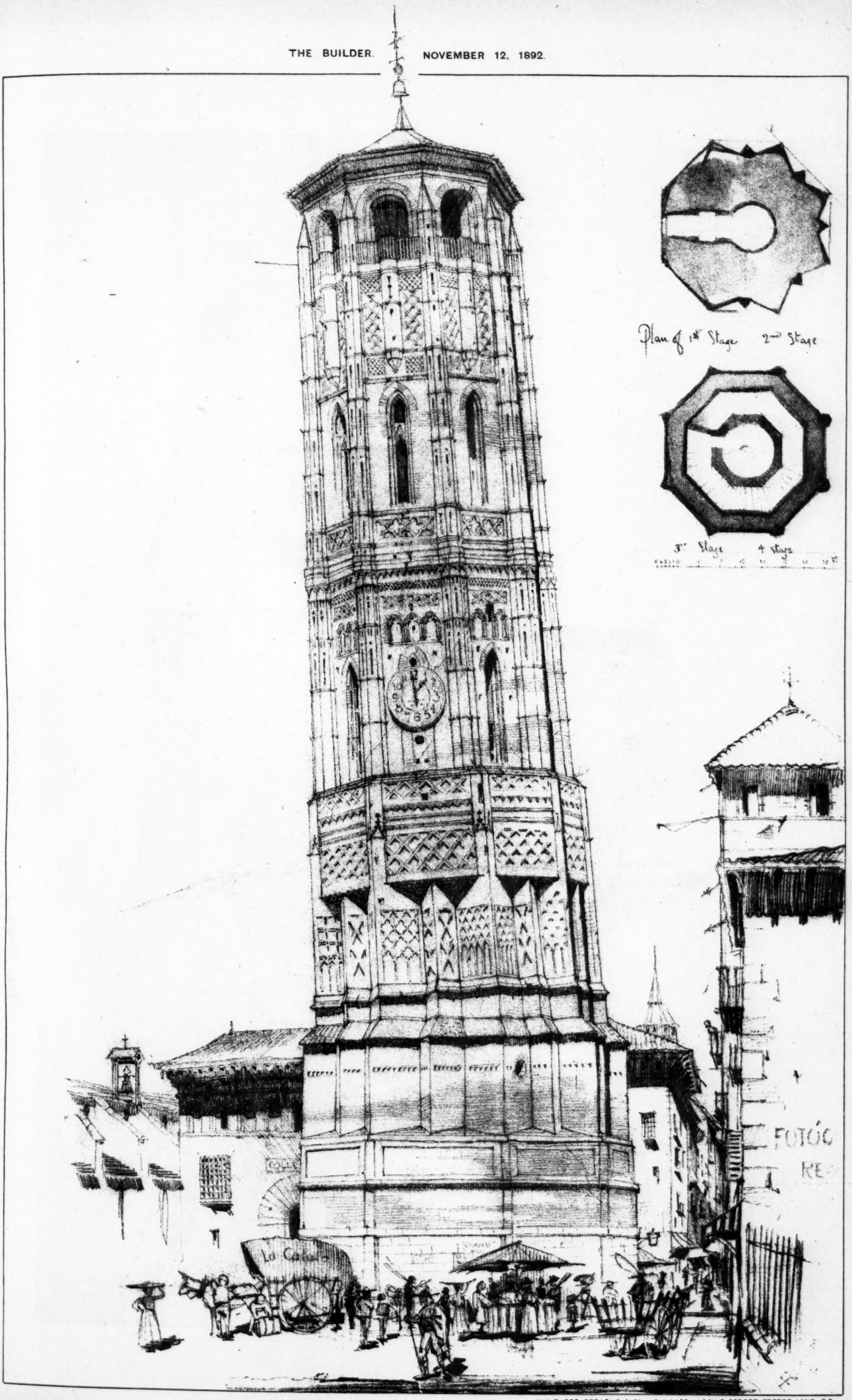

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